THE OIL WEEKLY

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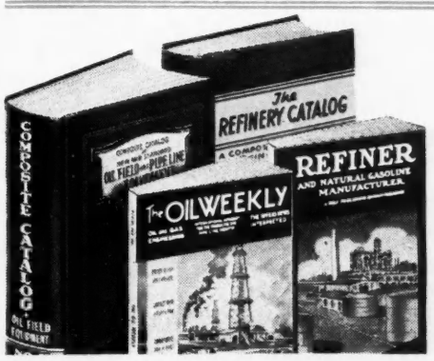

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The Oil Man's Calendar

JAN.	
12–13	Louisiana Engineering Society, St. Charles Hotel, New Orleans.
FEB.	
12–15	American Institute of Mining & Metallurgical Engineers, New York.
MAR.	
14–15	American Petroleum Institute, Mid-Continent District, Division of Production, Wichita, Kansas.
28–29	American Petroleum Institute, Southwestern District, Division of Production, Houston, Texas
31	Western Petroleum Refiners Association, Wichita, Kansas.
APR.	
10–12	American Association of Petroleum Geologists, Chicago.
11–12	American Petroleum Institute, Eastern District, Division of Production, Columbus, Ohio.
18–19	National Petroleum Association, Cleveland, Ohio.
MAY	
18–25	International Petroleum Exposition & Congress, Tulsa.
26–27	Petroleum & Natural Gas Conference, State College, Pa.
27–31	American Petroleum Institute, Mid-Year Meeting, Ft. Worth, Tex.

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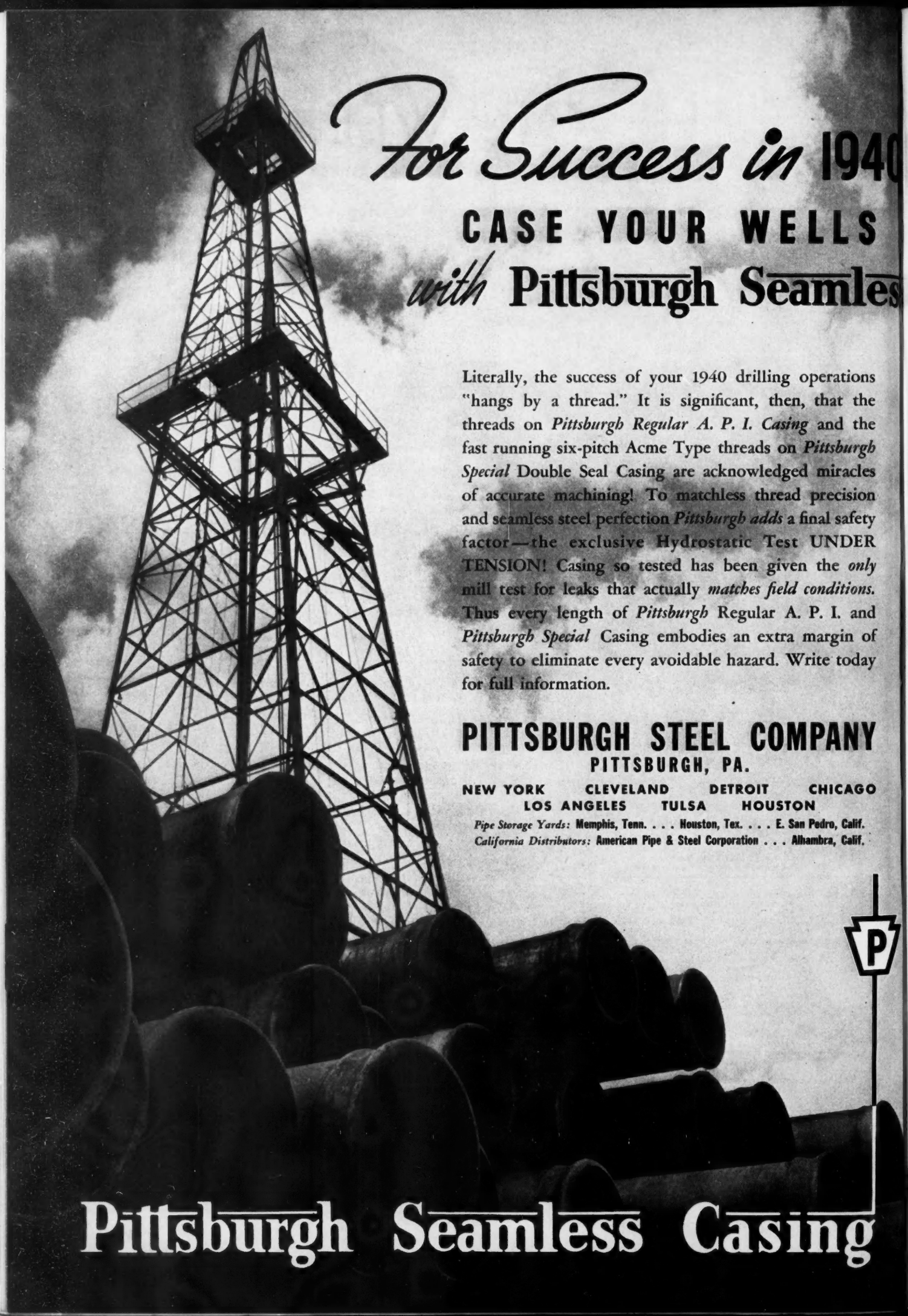
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THE OIL WEEKLY

JANUARY 1, 1940

VOLUME 96 NUMBER 4

The Week's Panorama

NEW YEAR statements by oil men have been generally cheerful. Further increases in consumption of petroleum products are expected in 1940, following the setting of a new record in 1939.

Demand Growing . . . . .

Domestic demand for all oils is expected to be 4 to 6 percent larger in 1940 than in 1939, with fuel oils showing somewhat larger gains than gasoline.

It is generally agreed that the export outlook is clouded and uncertain, because of war; and shipments abroad are expected to be only about the same as in 1939, if that large.

The industry's over-all inventory situation is regarded as favorable, but it is generally recognized that the large stocks of gasoline represent a serious handicap, inasmuch as that item is the industry's principal product.

Too Much Gasoline . . . . .

No improvement in the unsatisfactory gasoline inventory situation was reflected in the latest weekly petroleum statistics, covering the 7 days ended December 23.

On the contrary, gasoline stocks became somewhat more excessive. Although crude runs to stills were curtailed a little further, with the result that refineries turned out 89,000 barrels less gasoline than in the previous week, 549,000 barrels went into storage.

The stocks stood December 23 at 78,707,000 barrels and were 7,650,000 barrels, or 10.8 percent, larger than on the corresponding date last year.

Economists' estimates of needed working stocks indicate that the present inventory is 10,000,000 to 15,000,000 barrels larger than necessary.

Fuel Oil Stocks Light . . . .

While gasoline production is larger than desirable, yields and production of fuel oils continue smaller than the situation justifies.

Heating oil stocks are being depleted at a rate that is rapid even for this season, and supplies are relatively scarce. The present inventory is about 3½ percent smaller than that held a year ago, whereas demand is up more than 10 percent.

Stocks of residual fuel oils also are relatively light, having continued to decrease consistently, in response to booming industrial production. Nearly a million barrels came out of storage in the week ended December 23, and the remaining supply was about 11½ percent smaller than that held a year previously, although demand has been running about 10 percent higher.

Aviation Gasoline . . . . . .

The recently instituted monthly report of the Bureau of Mines on aviation gasoline showed that output of that product in October, 1939, represented 1.6 percent of all United States motor fuel production. Having totaled 859,000 barrels, the output averaged 27,710 barrels daily.

The maximum capacity for production was found to be about 1,500,000 barrels monthly, or about 50,000 barrels daily.

Exports of aviation gasoline in October totaled 287,000 barrels, compared with 206,000 in September, 221,000 in August, 266,000 in July. Domestic demand in October plus an undetermined but apparently large addition to stocks amounted to 602,000 barrels.

Stocks September 30 were not determined, but those October 31 totaled 2,400,000 barrels, equivalent to about three months' production.

Only about 25 companies were found to be making aviation gasoline.

Various production methods were employed, including particularly the leading of selected straight-run fractions, polymerization - hydrogenation, catalytic cracking-reforming, and catalytic alkylation.

Aviation gasoline differs from ordinary gasoline chiefly in having higher octane rating and lower vapor pressure. The octane rating ranged from 70 to 100 but averaged only 84, compared with 72 for present regular grade gasolines, indicating continued use of relatively low-compression motors in planes, here and abroad.

Employment Good . . . . . .

It is anticipated that figures on factory employment and payrolls for December will show better than seasonal results, following an unusually good November. Employment in the non-agricultural industries decreased only 100,000 in November, against a normal decrease of 350,000 for the month.

Natural Gas . . . . . .

In response to improved business conditions, consumption of natural gas resumed the normal upward trend in 1939, after having declined temporarily in 1938.

The final report of the Bureau of Mines on 1938 results showed a 5 percent decrease in marketed production, the first decline since 1933. From the peak of 2,407,620,000,000 cubic feet reached in 1937, the marketed production dropped off to 2,295,562,000,000 cubic feet in 1938.

All the major classes of consumption except field use decreased in 1938.

The 1938 consumption was divided into the following major classes: field use 29 percent, domestic consumption 16 percent, commercial consumption 5 percent, carbon black manufacture 14 percent, fuel in electric public-utility power plants 7 percent, fuel in petroleum refineries 5 percent, fuel in cement plants 2 percent, and all other industrial purposes 22 percent.

More Demand Gives Oil Despite Several

AFTER discounting the possible effect of war demands, which is an extremely perplexing appraisal problem at this time, oil's chances for a good year during 1940 are considered fairly promising despite some rather acute and unhealthy industrial problems. This is the opinion expressed in year-end statements of oil company executives and other sources close to the industry.

Foremost among the favorable factors is the unanimous anticipation of an increase in consumption, and the general healthy condition of the crude oil supply situation as a result of persistent withdrawals from storage. Offsetting these conditions, however, is the continued excessive operation of refineries, which has resulted in gasoline stocks rising to an all-time peak that is something like 10 million barrels greater than desirable. Still another unfavorable factor mentioned is the lack of production regulation in Illinois, and thus creating dislocation and disturbance of production markets.

Year-end statements of the various parties follow:

Outlook for Next Year Fairly Promising

By W. S. FARISH, President Standard Oil Company (N.J.)

IT is impossible to review business in 1939, or guess what it will be in 1940, without attempting to appraise the effect of war demands. General expectation of large foreign increase has not been realized. In consequence, plans have necessarily been materially changed. Indicative of the uncertainty in planning under today's conditions is the increase in tanker freight rates of over 200 percent since the end of August.

As the record of petroleum consumption in the World War was phenomenal, it was logical for most of us at this time to expect substantially increased demands. That this has not occurred is due to several reasons. Most important is the limited degree of war activity. Another is the severe restrictions placed on use of oil products in all Europe. Still another is the loss of exports to Germany.

The total of crude oil and gasoline exported in 1939 was below that in the previous and reasonably peaceful twelve months. There was an increase in sales abroad of Diesel-type fuels and miscellaneous products, but even taking this into account, the combined exports showed a reduction last year that was particularly marked in shipments in the last four months from the United States Gulf and Eastern seaboards.

At home there was a further gain in gasoline consumption about in keeping with the rise we have been led to expect while the motor car industry continues to sell new units faster than older cars are retired. It is estimated that the United States used about 553,000,000 barrels of gasoline, and even subtracting the decrease in exports, this meant a gain of 4.8 percent in total demand. However, the increase was not sufficient to prevent an unhealthy addition to domestic stocks. These were "upped" 8½ million barrels, and there is at least that much excess gasoline in storage today, with crude runs to stills abnormally high.

The crude oil supply situation is in a generally healthy condition. For the second successive year there was a substantial draft on stocks above ground. Present supplies appear to approximate more closely the quantities needed as working inventories. The 36-degree Oklahoma and Kansas crude oil price dropped to an average of $1.02 per barrel as compared with $1.17 in 1938. This resulted primarily from the dislocation of the supply and demand situation caused by the production of 93,000,000 barrels in Illinois as against 24,000,000 barrels in the preceding year. To force an outlet for this crude, not only were prices posted at levels below those required to meet competition from other major sources of supply, such as the Mid-Continent area, but in addition large quantities were sold at a considerable discount below the posted price. Another influence that undermined crude prices was the movement of as much as 200,000 barrels daily of Arkansas, Louisiana, Texas and other crudes at prices below the general market.

To avoid waste and improve the efficiency of the producing effort, it is to be hoped that Illinois will pass a conservation law. This, together with the efforts of the conservation authorities in the other oil states in preventing waste will avoid excessive production.

It looks as though 1939 net earnings for the U. S. industry are well below those of the preceding year. Preliminary reports for the first three quarters showed decreases averaging about 40 percent but the final three months will be much better.

The outlook for next year is fairly good. Earnings should be benefited if Illinois adopts a conservation program as uneconomic overproduction in that area would be curtailed. The effect of the war is highly problematical, but it now appears unlikely that there will be any broadening in the demand for exports in the near future.

Promising 1940 Outlook Acute Problems

Six Percent Increase in Demand Anticipated

By ROBERT H. COLLEY, President The Atlantic Refining Company

DURING 1939 the American public was able to consume a record volume of petroleum products at a cost which amounted to nearly $90,000,000 less than it would have had to pay for an equivalent volume at 1938 prices. Once again the industry was able to demonstrate its long-established ability to supply increasingly larger volumes of increasingly higher quality products at decreasing costs to the consumer. Total domestic consumption of petroleum products during 1939 was approximately 1,090,000,000 barrels, nearly 8 percent more than in 1938. Present indications are that 1940 domestic demand for petroleum products will exceed that of 1939 by a little more than 6 percent.

Although the petroleum industry's ability to improve its products while lowering its prices has been due to its relative freedom to conduct its business on the basis of free initiative and free competition, the record of the industry during 1939 was interspersed with illustrations of the trend of legislative thought and action toward uneconomic restrictions and controls Throughout the year the industry was confronted with a succession of governmental investigations, proposals for the divorcement of the producing and refining divisions from the marketing divisions proposals for federal control of oil conservation, and a long list of proposals for the imposition of discriminatory taxes on the industry's products and facilities.

Despite these distractions the industry continued to make progress along lines calculated to maintain its record of service to the public. During 1939, through its exploratory drilling activities, it discovered new underground supplies of crude oil more than ample to replace withdrawals for consumption, so that at the close of the year the American public was assured of a larger reserve of crude petroleum than at any other period in the history of the industry.

The total footage of wells drilled during the year was approximately 81,000,000, or more than 15,000 miles. Two new states, Nebraska and Mississippi, were added to the oil producing group. More than 3500 miles of new pipe line were constructed, making 1939 the most active pipe line construction year in nearly a decade. Modernization and expansion of refinery capacity made it possible to supply consumers with a greater volume of the higher octane gasolines, and contributed to greater operating efficiency in commercial and military aviation through increased production of 100-octane aviation gasoline.

At the close of 1939 the industry's internal affairs were in reasonably good order. Inventories of crude and refined products, with the exception of gasoline, were in a strong statistical position, having been reduced in total by approximately 44,000,000 barrels during the year. Supplies of raw material were ample. The threat to crude prices of over-production from new fields had been largely dissipated. Prices of petroleum products were at levels providing an annual return on investment about equal to the year 1937, and profits appeared to be fairly equitably distributed among the industry's several divisions.

Looking forward over the coming 12 months, current expectations are that domestic demand for petroleum products in 1940 will approximate 1,163,000,000 barrels, an increase of 73,000,000 barrels over the 1939 record year. The outlook for export demand remains cloudy, but the indications are that the major part of the expected increase in the industry's operations will be for domestic rather than foreign consumption. All in all, the petroleum industry is in a moderately good position to share in the increase in national prosperity which everyone hopes is on the way.

Excessive Gasoline Stocks Are Heavy 1940 Burden

By Independent Petroleum Association's Committee on Balance of Supply and Demand

TO meet consumptive demand and provide for an adjustment in excessive gasoline stocks with which the industry is entering the new year, crude oil production during the first quarter of 1940 should be approximately 300,000 barrels less per day than the current production level. This is the opinion of the Independent Petroleum Association of America's Committee on Balance of Supply with Demand, which has issued its report covering the final quarter of 1939, with forecast and recommendations for the industry's producing and

refining operations in the first three months of the next year.

Two months ago this committee noted that the petroleum industry was in a generally more favorable statistical position than it had been previously in 1939. The committee warned, however, of the danger of excessive production and refining activity and recommended a relatively low rate of production during the final quarter of the year to avoid the accumulation of excessive stocks of crude oil or refined products. Since October 1, 1939, crude oil production has been excessive and substantially above our recommendation while crude runs to stills have been at record levels. As a result, the industry will start the new year with from 10 to 15 million barrels oversupply of gasoline in storage. The strong recovery in the demand for other petroleum products, particularly fuel oils, has encouraged the operation of refineries at record levels with little apparent regard for the increasing gasoline inventories. There is no evidence that the major refiners are using more of the low grade crude oil so that a larger proportion of fuel oil and heating oils might be recovered and thus reduce the waste incurred in excessive gasoline stocks. The committee's report urged that this program be adopted to the greatest extent practical.

Crude Production

Crude oil production during November and for the first 11 months of 1939 has averaged below the estimate of demand as prepared by the Bureau of Mines. This is true despite the fact that several states have consistently produced in excess of the bureau's figures.

Due mainly to the production rate in Texas, production during November averaged approximately 37,000 barrels per day less than the bureau's estimate in the area east of California. Louisiana, Kansas, Michigan, Wyoming, Illinois, Arkansas, Montana, and California each produced at a higher rate than that estimated by the bureau. For the first 11 months of the year, the principal states producing above the bureau's figures were Illinois, California, Michigan, Kansas, and Arkansas.

In the October report of this committee, attention was drawn to the reduction in crude oil stocks during the five months ending September 30, 1939. It was pointed out that a gradual reduction of these stocks to minimum working levels was believed to be a sound and practical means of avoiding waste. During October and November, crude stocks east of California increased at the rate of about 13,000 barrels per day and are still increasing. This increase was due primarily to additions to storage of crude oil from Texas, New Mexico, and Kansas. Stocks of Oklahoma crude were reduced at the rate of about 40,000 barrels daily.

Imports

One of the most dangerous aspects of the supply and demand situation is the threat of large increases in imports of cheap foreign oil as a result of the reduction in the excise taxes granted in the reciprocal trade agreement with Venezuela. Under the terms of this agreement, imports of petroleum at the reduced tax rate will be admitted in a quantity equal to 5 percent of the quantity of crude oil run to stills. The State Department has stated that it does not believe that this represents a large enough volume to be detrimental to the domestic industry although practical experience has shown that a much smaller percentage of low cost goods is capable of demoralizing markets and demoralized markets in the petroleum industry contribute directly to waste and decreased reserves. The reduction in import taxes may mean a large increase in tax-paid imports in 1940 unless the importing companies recognize the damage that would result to the entire domestic petroleum industry and refrain from so doing. This represents a very real threat to the future efforts to bring about an assured balance of supply with demand.

Total imports during this year are about 15 percent larger than in 1938, the largest part of the increase being in oil brought directly into our domestic markets.

Refining

Refining activity has been at an all-time record high. Crude runs to stills during November averaged about 3,513,000 barrels per day or 8.3 percent higher than during the same month of last year. Refinery runs in the Indiana, Illinois, Kentucky area during the month averaged 108,000 barrels per day, or 22.5 percent above last year. All other refinery areas with the exception of the Inland Texas area also showed increased activity over 1938.

Although gasoline stocks normally increase during December, these stocks on November 30 were 10,000,000 barrels above what has been estimated to be a sound level for the end of the year. From this, it appears that there will be between 10 and 15 million barrels of excess stocks of gasoline on hand on December 31.

Fuel oil stocks have been substantially reduced and are reported to be near economic levels in the areas east of California. Stocks of gas oil and distillate fuel are 11 percent lower than last year east of California while residual fuel stocks in that area are 25 percent lower.

Outlook—First Quarter of 1940

The committee in its report in October of this year estimated that crude oil production east of California during the last three months of the year should average 2,770,000 barrels per day. Actual production has exceeded this estimate by approximately 200,000 barrels daily and the high rate of refining activity has absorbed almost all of the current production, only 700,000 barrels of crude oil going into storage during October and November. As a result, gasoline stocks have increased during these months at the rate of about 85,000 barrels daily whereas this committee recommended a reduction in gasoline stocks during the last three months. The excess of production of 200,000 barrels per day over this committee's estimate is equivalent to the excess building up of gasoline stocks during the period in contrast to the recommended reduction in these stocks.

While many feel that due to the wars in Europe and improved domestic conditions that the outlook for the first quarter of 1940 is encouraging from the standpoint of probable demand for petroleum products, it seems unwise at present to anticipate any material increase in the early months of 1940. Several factors indicate that this is a sound policy. From data available up to the present time, there is little evidence of any such increase. Foreign nations have been accumulating reserve supplies in preparation for emergencies and are controlling the consumption of petroleum products. In addition, it may be some time before adequate convoy systems across the Atlantic are perfected. Considering both the expected increase in domestic con-

sumption and the export situation, a 5 percent increase in gasoline demand over the first quarter of 1939 is estimated to be a sound basis for forecasting.

Stocks of gasoline on December 31 will be at an all-time record high for that period of the year. To avoid waste, operations during the first three months of 1940 should be adjusted so as to provide for less than the usual seasonal increase in these stocks. This should be done by reducing the present rates of crude production and refining activity which are excessive. Refiners should make every effort to meet the demand for other petroleum products by adjusting their runs accordingly and drawing on refined product storage.

To meet consumptive demand and provide for an adjustment in gasoline stocks to sound economic levels on March 31, 1940, the following rates of crude oil production are estimated to be necessary during the first quarter of 1940:

	Barrels Daily
East of California	2,735,000
California	565,000
Total U. S.	3,300,000

This estimate does not provide for a further reduction in crude stocks which are at a relatively low level.

Reduced Prices and Profits Mark 1939 Peak Consumption

By AXTELL J. BYLES, President American Petroleum Institute

NEARLY every manufacturing and consumption record of the petroleum industry was broken in 1939, but early estimates indicate that the industry's net earnings will be below even the reduced profits of 1938. Consumer prices generally slipped to near-record lows.

Several new catalytic, chemical, and thermal refining processes, further assuring more-than-adequate supplies of super aviation fuel and also advancing the development of a host of synthetic basic industrial chemicals, were announced in 1939. These are only a few among many technological advances made in all branches of the industry during the year.

Discovery of oil in commercial quantities in Mississippi and Nebraska in the last quarter brings to 23 the number of U. S. oil-producing states and, with the new fields and new producing strata opened up in other states during the year, adds substantial quantities of crude oil to the nation's proved reserves. These developments re-emphasize that U. S. consumers need fear no exhaustion of petroleum.

Incidence of European war had little effect on the industry. Exports of motor fuel, for example, declined in October, the month of latest available statistics. Industry economists make no predictions for 1940, however, but point to the unusual nature of the war, the loss of the Central European countries as customers, the substantial Asian and South American sources of supply now open to England and France, and to the rationing of petroleum products throughout Europe, as evidence that the war may continue to have little effect on U. S. petroleum trade in 1940.

Late in September the Temporary National Economic Committee began a four-week investigation of the industry. Testimony presented convincing evidence that the industry is typical of the best in the American system of free enterprise, and is thoroughly capable of solving its own problems. Another Congressional group, the Cole Committee, has been conducting hearings on the Cole Bill, designed to effect federal control of oil production. The bill has been denounced as unnecessary by many in the industry and by state officials, and was protested in a resolution of the American Petroleum Institute's board of directors in November.

Large increases in the volume of petroleum products used by U. S. consumers, particularly by motorists and by industry, again called attention to the dependence of modern living standards upon petroleum. The 1939 consumption of all petroleum products averaged about 1,725 gallons for every U. S. family. More gasoline, light fuel oil, kerosene, and lubricants than ever before in the industry's history were manufactured and sold to consumers; only residual fuel oil of the major products showed consumption below the previous high, although the demand was substantially above 1938.

Motor-fuel production in the industry's 445 refineries, which ran 1,238,959,000 barrels of crude in 1939, is estimated at 596,111,000 barrels, a 7.2 percent increase over 1938; domestic consumption of motor fuel increased 5.5 percent, to 552,000,000 barrels, while exports dropped 7.9 percent to 46,163,000 barrels; total refinery demand thus was 598,163,000 barrels, an increase of 4.4 percent.

An estimated 133,775,000-barrel domestic consumption and 33,407,000-barrel export demand for gas oil and distillate fuel oil compares with total 1939 refinery production of 162,480,000 barrels. Increases of 13.9 percent in domestic consumption, of 12.7 percent in export demand, and 7.1 percent in production over 1938, are indicated. Chief users of this light fuel oil, accounting for about 70 percent of the domestic total, are automatic domestic oil burners; it is believed 1,860,000 were in operation in U. S. house-heating plants at the end of 1939.

The producing branch of the industry operated at a 3.8 percent higher rate than in 1938, crude-oil production totalling an estimated 1,260,099,000 barrels. This is slightly lower than the 1937 all-time peak, however. Production in other countries is believed to have increased 8.5 percent to 817,532,000 barrels, making total world production 2,077,631,000 barrels. The U. S. proportion of the total dropped fractionally to 60.7 percent.

The number of completed wells was 1.7 percent under the 1938 total, but revived activity in the last quarter indicated an upward trend in oil-well drilling. Of 1939's 27,038 completed wells, 18,459 found oil and 2,191 struck gas.

Stocks of crude petroleum in storage at the end of the year totalled 237,825,000 barrels, down 37,133,000 barrels from the December 31, 1938 total, and the lowest year-end stocks since 1921.

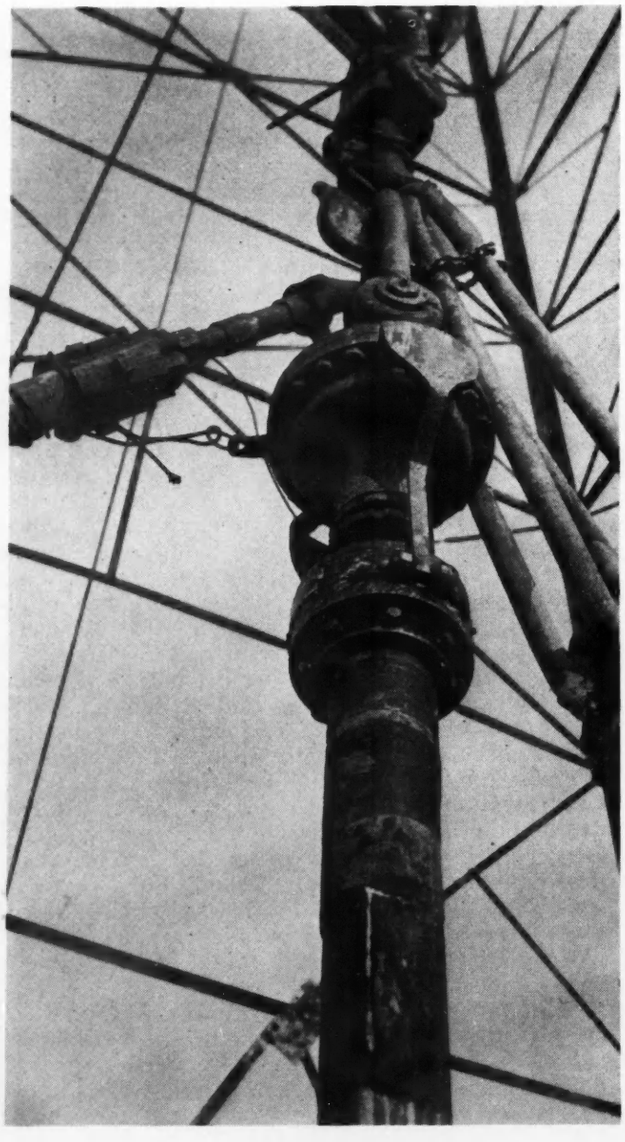
The United States continued its favorable foreign-trade balance in crude petroleum, with exports of 73,594,000 barrels, more than

[Continued on page 39]

Simultaneous and Continuous Logging and Drilling

By BRAD MILLS, Associate Editor

CONTINUOUS electric logging of formations while simultaneously conducting regular oil field drilling operations is now possible. The method, which uses the bit as an electrode, has been developed over a long experimental period. The process, which involved ticklish electrical and mechanical problems, has progressed to the point that it has been used on six wells and where its possibilities are said to be encouraging.



Insulating the bit from the drill stem and providing a fully insulated means of connecting the bit on bottom to recording instruments on the surface has been an achievement of first rank. Obviously to do this required special connections at numerous points, if routine drilling operations were not to be interfered with. This is accomplished essentially by insulated wire, special connections in the drill joints, use of a brush box below the swivel, a special kelly, and surface leads to the recording instruments. A bakelite-coated drill collar is the final insulation medium above the bit. This 10-foot section provides sensitivity for the electrode with a minimum current loss through the mud stream. The method depends principally on the reaction of the bit in the different formations, and only through full insulation of the bit from the drill stem can satisfactory recordings be made at the surface.

The various and sundry implements for carrying the circuit to the bottom of the hole are shown pictorially in the pictures that accompany the article.

The circuit consists principally of a battery connected to a meter, which in turn is connected to leads running to the derrick. The main lead runs up the standpipe, around the rotary hose, to a brush box containing an ordinary collector ring and a set of brushes. The circuit is then taken past the kelly by a special conductor. Thence, it leads down the drill pipe through special connections to the drill collar assembly, which consists of an insulated bakelite section above the bit, a testing switch, and a special steel drill collar to provide weight and rigidity.

Although only one cable is used between the bit and the surface, both the earth potential and the impedence (resistance) are recorded on meters at the surface. A small alternating current oscillator (about 20 cycles) is used to energize the cable, or

1. The logging circuit enters the drilling column at a brush box (shown here) that is clamped between the kelly and swivel, after running from the battery meter up the standpipe and around the rotary hose. The brush box contains an ordinary collector ring and set of brushes. Arms projecting downward hold a portion of the box stationary, in which part are mounted the brushes. The collector ring, fixed to the main body of the box, rotates with the drill stem. The current is taken past the kelly by cutting a groove into which a 3/8-inch pipe is embedded and welded. The insulated cable passes through this 3/8-inch tube.

(Pictorial story continued next page)

Electric Achieved

more strictly to energize the earth around the bit. The impedence or alternating current meter is not affected by the direct current, while the potential or direct current is not affected by the impedence measurement. The earth potential is measured in millivolts, the resistance in ohms. The earth potential is measured direct from the bit as direct current. The impedence is the apparent resistance in an electric circuit to the flow of alternating current, corresponding to the actual electrical resistance to a direct current. It is the ratio of the electromotive force to the current.

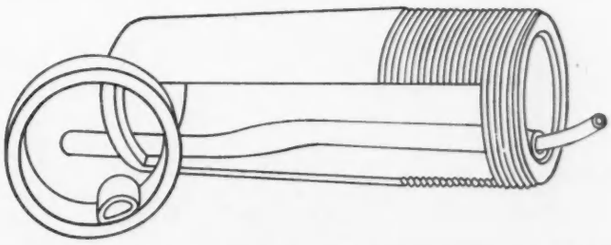
The log made while drilling is checked by resurveying the hole. Part of the drill pipe is pulled, the dummy snapped on, and the bit run back into the hole as a check. It is also easy to go back into the well and pick up portions of the hole fully surveyed while drilling.

The drill pipe and most of the other equipment are handled as if they were conventional items. The crew stabs and makes up the drill pipe with little more care than if it were ordinary pipe. The pipe itself is standard grade; only the pressed-in connections in the tool joints and the brazed conduit running down each joint differentiating the assembly from an ordinary drill string.

The bakelite shell covering the 10-foot section of drill collar near bottom gradually wears out, but it stands the abrasive action very well. The full bakelite insulation is moulded to the drill collar with steam platen presses.

Experienced operators are kept on a well, since interpretation of the electric log involves technicalities not usually understood by an ordinary drilling crew. The recording equipment proper might be classed as standard items that could be bought by any company, but accurate interpretation of readings requires special training. It might be possible to train regular drilling crews to observe and interpret the charts.

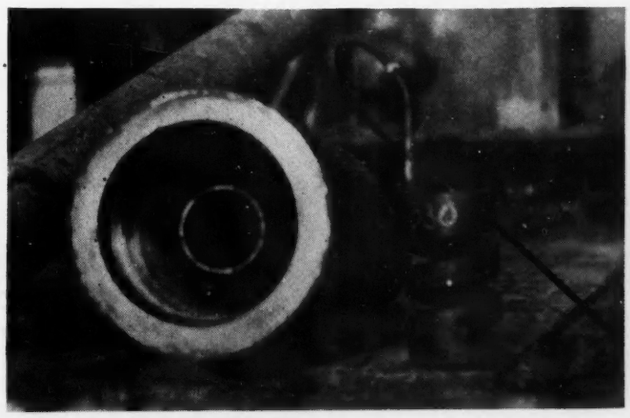
Development of this simultaneous method of electric logging and drilling has been under the direction of C. V. Millikan, chief engineer of Amerada Petroleum Corporation, but the work has been more directly under the supervision of David G. Hawthorn, development engineer for the company. John E. Owen, Geophysical Research Corporation, and J. L. Coulson, of Amerada Petroleum Corporation, also have assisted in the development of the method. The first work along this line, approximately six years ago, was done by J. C. Karcher, Geophysical Service, Inc.



2. The circuit then enters the drill pipe string. One of the principal difficulties in devising a working instrument was encountered in making suitable connections at the joints of drill pipe, and in protecting the cable from mud being circulated and from continuous whipping action as the pipe rotated.

Standard 4½-inch drill pipe and regular tool joints are used, but special additions are made to these items. Inside the drill pipe a small elliptical metal tube is brazed to the inner periphery during normalizing operations at the mill. The insulated wire runs through this tube or conduit. This is shown in the above schematic drawing.

How the problem of maintaining proper connections through the tool joints was whipped without interfering with regular drill pipe make up operations is shown in illustration No. 3.



3. The current is transferred from one drill pipe joint to the next one by means of steel rubber-insulated connections. These connectors are built integrally into the joints, and consist of a female and a male terminal. The male connection is pressed into the box end, and the female into the pin end. They make contact when the tool joint box and pin are made up. The connection is by spring tension between the two insulated terminals; rubber lips on the exposed ends sealing to protect the circuit from the mud stream. The insulated connections are shown in the two above photographs. They are covered with a heavy coating of synthetic rubber. By this method it is possible for the circuit to be maintained to the bottom of the drill stem, and still permit customary derrick floor make up and break out drill string practice.

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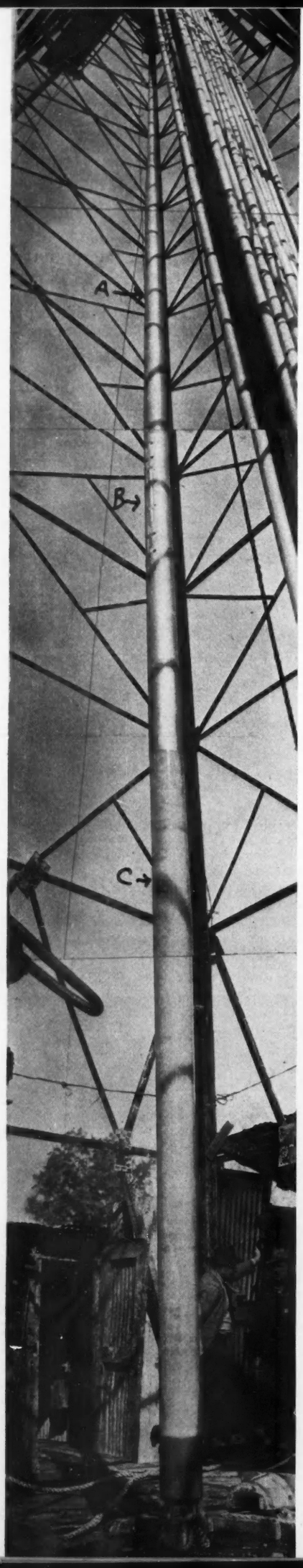
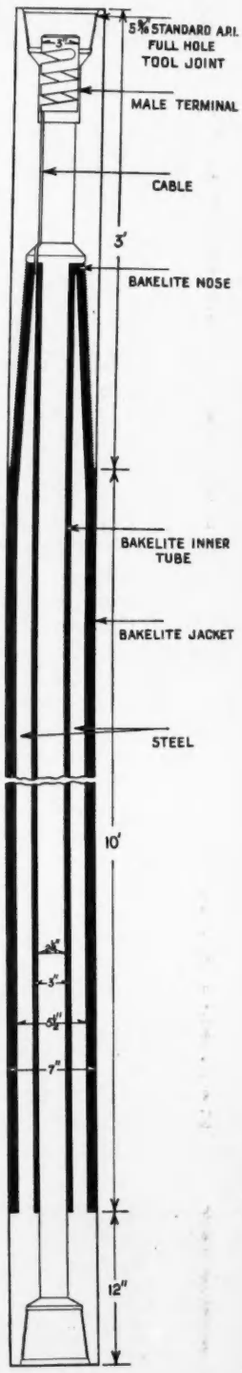


4. After passing through the entire length of the drill pipe string in the fashion described in preceding photographs, the circuit enters a special drill collar assembly, a composite view of which is shown at left. The special collar (A) at top is tapered or bottle-necked down to receive the drill pipe. The collar through which a lead runs to the special short sub immediately below, adds weight and rigidity to the column.

In the special sub (B) is mounted a testing switch for checking the circuit, details of which are explained in illustration No. 5.

Below the circuit testing switch comes a 10-foot bakelite insulated drill collar (C), an ingenious arrangement that insulates the bit from the drill pipe and provides for sufficient length of insulation to enable the bit to function with suitable sensitivity as an electrode, and to minimize conductivity losses through the mud stream. Details of this arrangement are shown in illustration No. 6. From the bit the current emanates or dissipates into the formation, and the resistance and earth potential are measured and recorded on meters at the surface.

5. The circuit testing switch, which provides a means for checking the entire drill stem circuit for both "continuity" and insulation resistance, is shown in a close-up view at left. The switch can be used for testing the circuit while going into the hole or while drilling is in progress. It is mounted in the special sub section of the drill collar assembly, as shown in illustration No. 4.



6. The bakelite-insulated drill collar section of the assembly is explained in the above cross-sectional drawing. It is bakelite covered on the outside of the steel shell to a thickness of three-fourths inch, while the inner bakelite tube is about half an inch thick. The coating provides sensitivity for the electrode (bit), and minimizes the current loss through the mud stream. The last male terminal in the circuit is shown at the top, with cable leading to the steel section in the drill collar. The bit is not shown, but it adds about 10 inches to this 10-foot assembly. Any type bit may be used.

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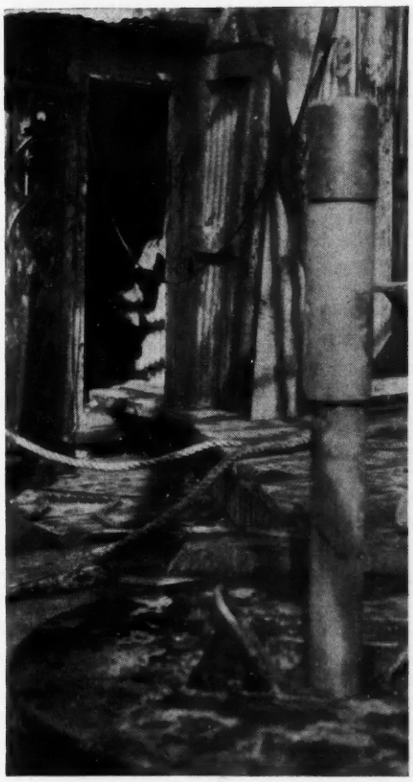
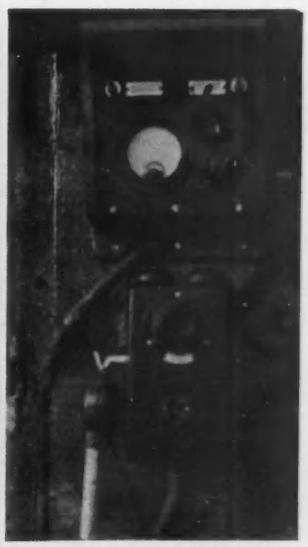


7. Each stand of drill is tested as it is added to the drilling string so as to be certain of a proper circuit all the way to bottom. A small ohmeter is used for this purpose. If any serious troubles are indicated by the ohmeter, a closer check is made by using a testing dummy, shown at left. This is a quick, simple means of by-passing the main lead around the brush box on the kelly. It connects through a testing panel (shown at extreme left) to the recording trailer and provides a rapid means of testing the circuit without picking up the kelly. This dummy also is used in resurveying the hole to check the log made while drilling, and also makes it easy to go back into the hole and pick up portions on which a further check may be desired.

8. All recording equipment is housed in the trailer at left, above, which is connected to the derrick floor by means of several insulated cables. The recording equipment is of standard type. At the right is the geologist's sample house. Small 300-watt generators may be seen behind the trailer. They provide alternating current for operation of the Selsyn motors.



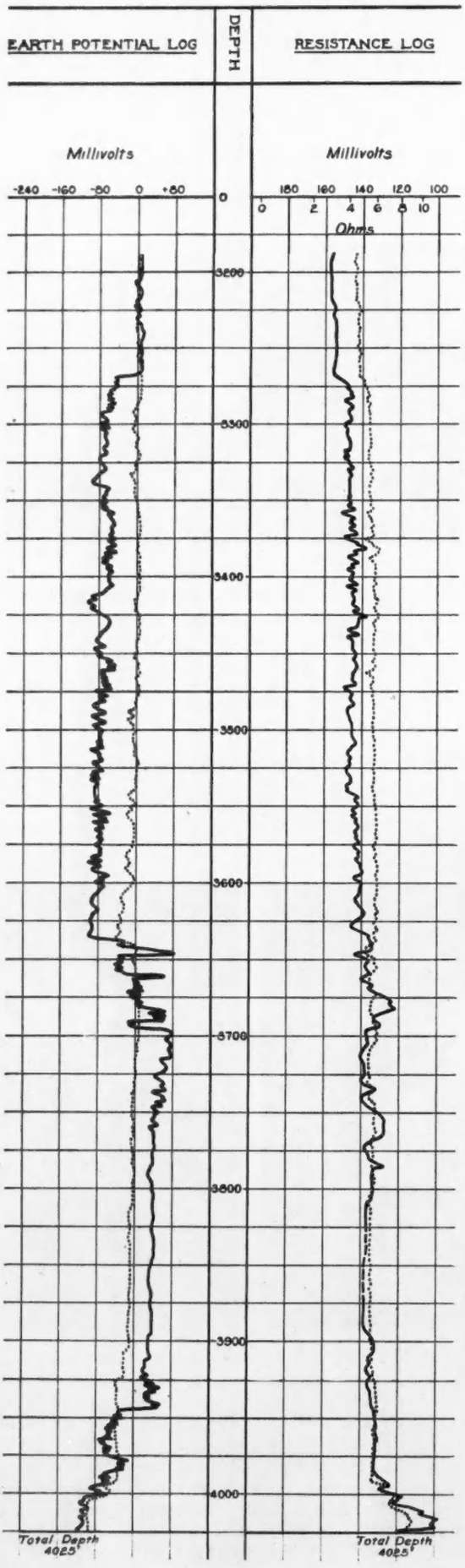
9. Several instruments are located on the derrick floor when the continuous electric logging device is employed. These include the Selsyn transmitter motor, the driller's switch panel, and the testing panel and telephone.

The Selsyn transmitter motor shown at left is fixed to the draw works drum shaft. This motor is tied electrically to the Selsyn relay receivers attached to the recording meters in the trailer. This is the meter drive, and provides depth coordination between the charts and the drill pipe.

The driller's switch panel (in the center), containing two switches with tell-tale lights, is mounted at the driller's stand. One switch controls the printer cutout used for shutting off meters when drilling is suspended. The other switch controls Selsyn motors used for keeping charts in step with the downward progress of the drill pipe when making connections.

At the right is a close up view of the testing panel and telephone on the derrick floor, connecting through to the recording trailer.

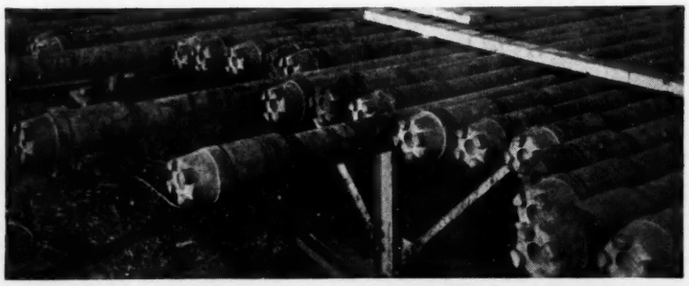
(Pictorial story continued next page)



10. The latest completion, and the sixth in all, where the continuous electric log recording method was used was on Amerada Petroleum Corporation's Hettie Berk 10 at Cayuga, Texas. The well was drilled from top to bottom with this electric logging equipment, and the recorded log from 3200 feet to bottom at 4025 feet is shown at left. This was the first operation in which an oil sand was penetrated and logged under such conditions. Other wells drilled in proven areas with this electric logging equipment were subsequently completed with conventional equipment, due to a shortage of the special drill stem required.

The solid curves on the log show electrical data recorded simultaneously with actual drilling operations. The dotted curves are data taken by means of the dummy connection while running drill pipe back into the hole. The latter represent, so to speak, a resurvey of the hole taken with the drill pipe and just prior to conclusion of the test.

The company's geological department placed the top of the Austin in Hettie Berk 10 at 3267 feet and the base at 3635 feet. Eagleford shale extended from immediately below the Austin chalk to top of the Woodbine sand at 3945 feet. Upper part of the Woodbine sand extended to 3985 feet as shale and sandy shale, while the Boyer sand section was picked up at 3985 feet. The Boyer sand continued to bottom of the hole at 4025 feet, the lower section forming the producing horizon. A 5½-inch string of casing was perforated with 48 shots between 4011½ and 4023½ feet, and 2-inch tubing was run. The well made 195 barrels of clean oil through a ⅛-inch positive choke, with a tubing pressure of 425 pounds, casing pressure of 160 pounds and a gas/oil ratio of only 250/1.



11. When not in use both the box and pin ends of the drill pipe are closed with special protectors, which serve to shield the rubber-coated terminals. Protectors for the pin end are shown above.

12. For transporting the bakelite-covered, insulated drill collars, these larger steel cases are used. The small steel case contains the circuit-testing switch sub used as a part of the drill collar assembly at the bottom of the hole.

South Louisiana Reserves Are Increasing Steadily

By CHARLES LEYENDECKER, Staff Writer

SOUTH Louisiana is experiencing a peak in drilling activity and a remarkably large number of discoveries which are enabling the area to produce more oil daily than it has ever produced and at the same time steadily expand its volume of known crude reserves to an ever-rising level.

In the matter of completions during the past 11 months the district has been running close to, and in some weeks ahead of, the Texas sector of the Gulf Coast. When this period is reviewed it is seen that the Louisiana Coast completions were up 41 percent over those of the corresponding period of 1938—or 734 against 520 in 1938.

Even though the department of conservation took steps to reduce allowables in several fields in South Louisiana, production was up 2 percent over the same period of 1938. Through November of this year the cumulative production was 62,764,000 barrels, whereas in the corresponding period of 1938 the district produced 61,042,000 barrels. This increase continues due to field and sand discoveries.

Discovery Ratio High

So far this year there have been 14 new oil fields found in South Louisiana as compared to 19 the preceding year. However, the ratio of new discoveries to wildcats drilled remains about the same, that is, one new field to every five wildcats drilled.

The reason for this high ratio, even with hazardous and deep drilling, is found in the natural potentialities of the district and in the advancement of methods of finding oil. Geophysical work undertaken since 1935 is paying off.

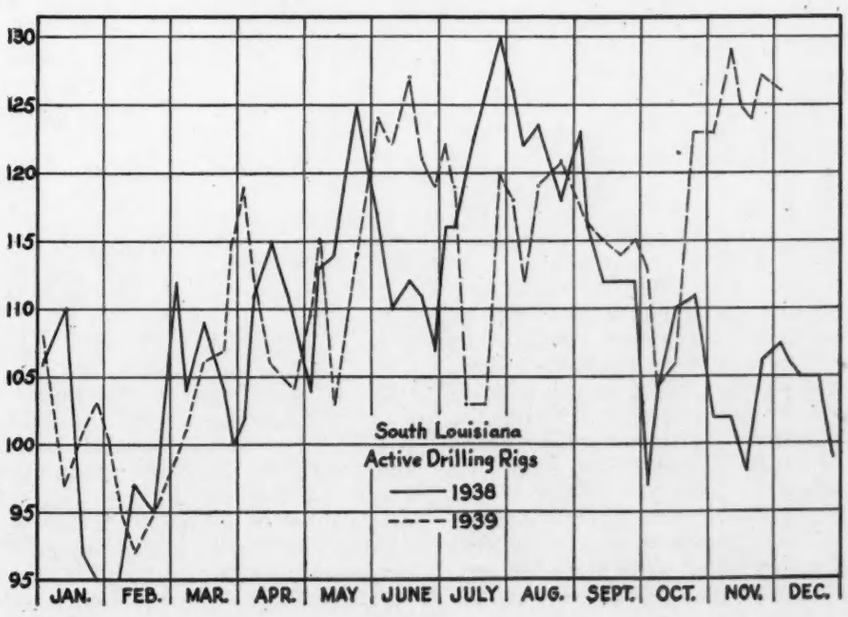
South Louisiana has been producing oil for 38 years, during which time recovery has amounted to nearly half a billion barrels. The region ultimately will produce several times that quantity from currently known fields, if present estimates of ultimate production are fulfilled.

Deeper Drilling Rewarded

Deeper drilling along the Louisiana Gulf Coast belt has been rewarded. Four new fields have been discovered during the past 11 months between 10,000 and 11,000 feet, the deepest being 10,915 feet. One has been found between 9,000 and 10,000 feet; seven have been found between 8000 and 9000 feet, and two have been found between 7000 and 8000 feet. Results of this deeper drilling are more noteworthy when it is realized that 52 new sands were discovered in old fields during the 11-month period, as against 44 in all of 1938. Nine of the new sands were below 10,000 feet, the deepest being 11,847 feet. So far this year there have been 32 wells drilled to below 11,000 feet; a third of these went below 12,000 feet. The deepest well this year in South Louisiana was drilled to 13,248 feet.

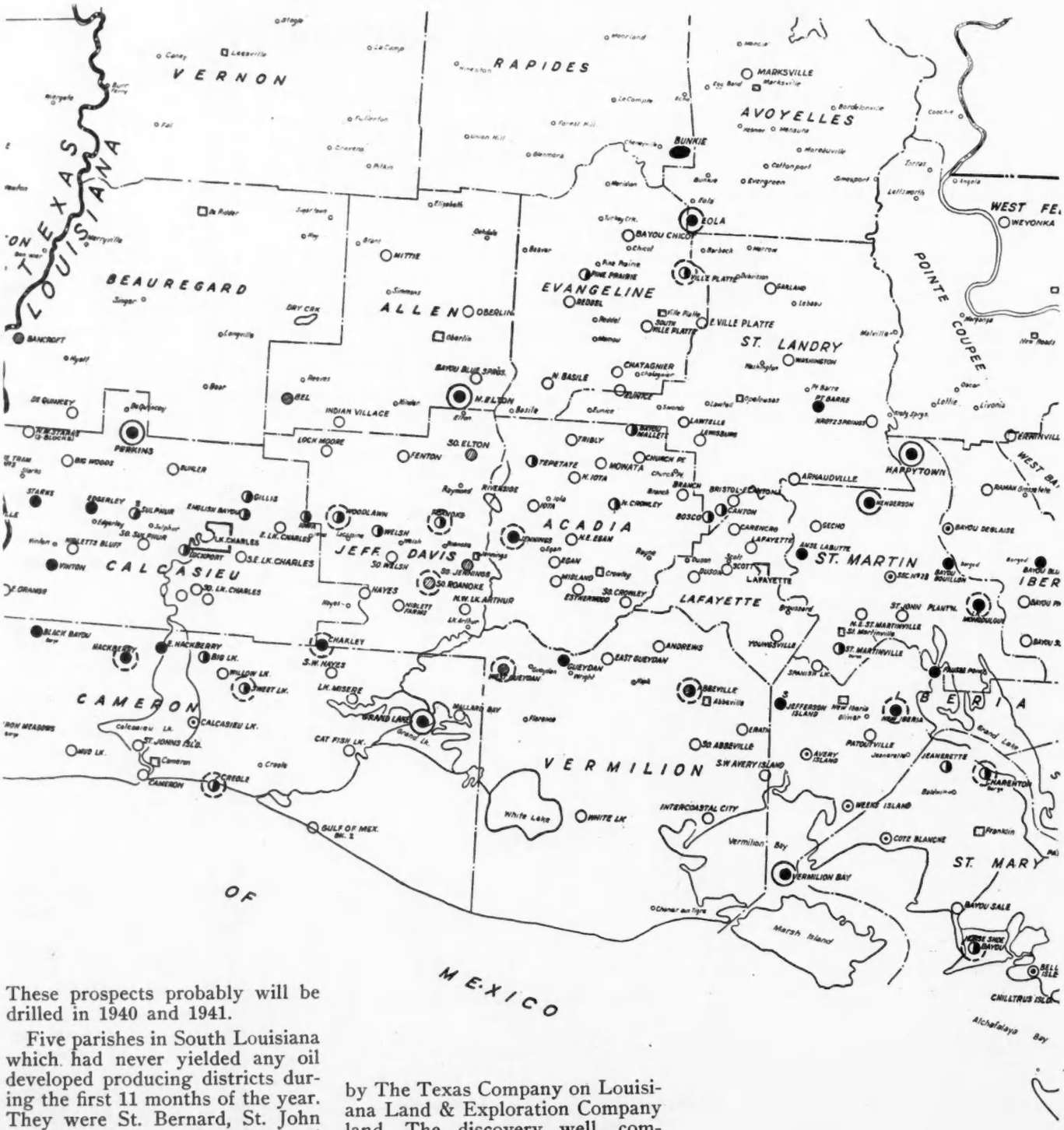
Wilcox production paid off for the first time in South Louisiana during 1939 at Eola, Avoyelles Parish. The trend of development for the past 11 months has been to establish other Wilcox fields. So far this play has opened one other area for Wilcox production, this being Ville Platte, Evangeline Parish. Eola started a widespread leasing and geophysical campaign along the Sparta-Wilcox trend in South Louisiana. Old prospects which had not been drilled deep enough were leased again and geophysical work was commenced.

Louisiana Coast Drilling Up Materially



Map of Louisiana Gulf Coast Area

Double circles indicate fields found during 1939. Broken double circle indicates fields in which new producing horizons were found.



These prospects probably will be drilled in 1940 and 1941.

Five parishes in South Louisiana which had never yielded any oil developed producing districts during the first 11 months of the year. They were St. Bernard, St. John The Baptist, Allen, Avoyelles and St. James parishes.

Of the 14 new fields discovered thus far in 1939 it is believed that Paradis and Eola will be the most important.

Eola and Paradis Important

Paradis, the first field entirely in St. Charles Parish, was discovered by The Texas Company on Louisiana Land & Exploration Company land. The discovery well, completed in mid-year at 9915 feet, came in flowing 120 barrels of 53.7-gravity distillate daily. During the latter part of November The Texas Company completed the second well 1½ miles northwest of the discovery for 1760 barrels of pipe line oil daily from nearly 200 feet of saturated oil sand at 10,340 feet. This deeper sand is expected to extend a mile farther northwest. Some are predicting that the field will be the largest in South Louisiana, with a possible maximum length of five miles. The largest field in South Louisiana today is Lafitte, Jefferson Parish, which covers about 3000 acres and is also operated by The Texas Company

and Louisiana Land & Exploration Company.

At Eola, Avoyelles Parish, the first field in the district to produce from the Wilcox, Sid Richardson's Haas Investment Company 1 logged over 100 feet of saturated oil sand and came in flowing 160 barrels of 44.5-gravity oil daily through a ⅛-inch choke from 8581 feet. This discovery put over a dozen rigs in operation in the area. Amerada Petroleum Corporation is the major lease holder and has been doing most of the development.

Barataria, the second field for Jefferson Parish, also might be classed as one of the major discoveries of 1939. The discovery well was The California Company's Adams-Rutley 1, which came in flowing 888 barrels daily through ¼-inch choke from 8214 feet.

Other Discoveries

Other new fields found in the district the first 11 months of this year, together with their discoverers and the parishes in which they are located were: North Elton, Bel Oil Corporation, Allen Parish; Perkins, Humble Oil & Refining Com-

pany, Calcasieu Parish; Grand Lake, Superior Oil Company, Cameron Parish; Vermilion Bay, The Texas Company, Iberia Parish; Lafourche Crossing, Mikton Oil Company, Lafourche Parish; Potash, Humble Oil & Refining Company, Plaquemines Parish; Kennilworth, Vendome Petroleum Company, St. Bernard Parish; LaPice, Shell Oil Company, St. James Parish; LaPlace, Pan American Production Company, St. John The Baptist Parish; Happytown, Shell Oil Company, St. Martin Parish, and Henderson, The Texas Company, St. Martin Parish.

Ville Platte in Evangeline Parish, a field which produced from the Sparta (Tate and Haas) sands, yielded its first Wilcox oil when Continental Oil Company completed Haas Investment Company 1 on the southeast side at 10,085 feet. The well came in flowing 312 barrels of 53.2-gravity oil daily from a thick sand section. Other wells around the flanks found the sand, which indicates that Ville Platte may have a new Wilcox pay drilling campaign in 1940. Subsequent drilling at Ville Platte showed two new Wilcox sands, one at 10,230 feet and the other at 10,118 feet. Each yields different gravity oil. It is understood that the Wilcox underlies a large part of the field and that a third test will be projected on those locations where the company has twin wells—one to the Tate and one to the Haas sand.

Venice Extension

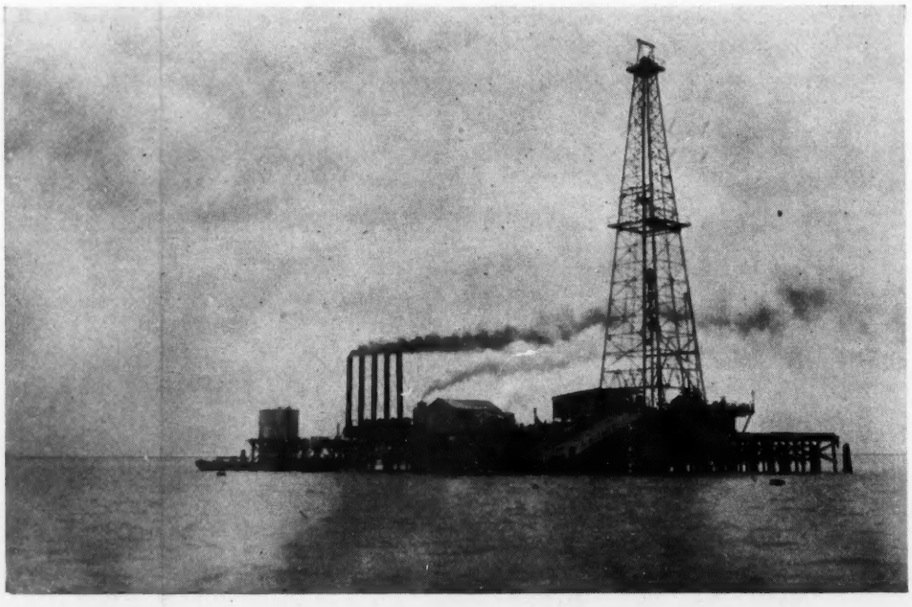
West of production at Venice 1½ miles, Tide Water Associated Oil Company logged over 160 feet of saturated oil sand in Buras Levee Board 6 during the fore part of December to open a new deep producing sand for the field. The well made 288 barrels of pipe line oil daily through ⅛-inch choke from 10,610 feet. The field now has six producing horizons.

Golden Meadows, Lafourche Parish, a field which has had more rigs running than any other in South Louisiana, had seven new oil sands discovered during the past 11 months. They were found from 2700 feet down to 10,040 feet. Golden Meadows covers a large area, and the leases are held by a number of operators who are drilling the district at a rapid pace. The shallow sand at 2700 feet is receiving most of the drilling. The Texas Company is developing the deeper sands.

Charenton, a St. Mary Parish field which has had only two new sands found so far this year, is another very active spot with an average of five wells completed each week in sands encountered around 1100 feet. Each well completed in the shallow sands immediately goes on the pump. Twin well drilling is being resorted to in some instances.

Other New Sands

Other new oil sands found in South Louisiana during the 11 months include one at Jennings and one at North Tepetate, Acadia Parish; one each at Sweet Lake and West Hackberry, three at Chalkley and two at Creole, Cameron Parish; two at Baton Rouge, East Baton Rouge Parish; one at New Iberia, Iberia Parish; one at South Roanoke, two at Woodlawn and two at Roanoke, Jefferson Davis Parish; one at Timbalier Bay, two at Lake Long, Lafourche Parish; three at Grand Bay, one at Lake Hermitage and three at Venice, Plaquemines Parish; one at Lake Mongoulois, St. Martin Parish; one each at Bateman Lake and Horseshoe Bayou, St. Mary Parish; one each at Gibson, Dog Lake and Bay St. Elaine, Terrebonne Parish; one at Abbeville and two at West Gueydan, Vermilion Parish; and one at Choctaw, West Baton Rouge Parish.



State 1, Superior Oil Company's discovery well of Grand Lake field, Cameron Parish

Because of its timeliness just now when Mexico is trying through every avenue to increase sales of oil abroad, the accompanying analysis of where her petroleum exports have gone since expropriation of the foreign controlled industry seems of particular interest.

The trend portrayed therein may well serve as a prologue to the drama of Mexico's fight to establish herself in the world petroleum marts of tomorrow.

This analysis, believed the most complete and accurate ever printed, covers exports through November, or up until a few days before the supreme court of Mexico dashed all hopes of recovering the properties through legal paths.

Storage Capacity Almost Filled As Expected War Demands Fail To Materialize for Mexico

EXPECTED war demand for Mexican oil in Europe has not materialized, at least the movement has not materialized, and with stocks increasing, the limit of safe storage capacity soon will be reached. Careful estimates are that maximum storage facilities will accommodate about 18,000,000 barrels of oil. The peak of safe storage volume is placed at 1,000,000 barrels less.

Mexican petroleum exports during November, including crude and other oil products, totaled approximately 1,095,000 barrels, a drop of 245,000 barrels from the October total.

Indications are that production, which by reason of falling demand has shown a steady decrease since September, will be pulled down to about 100,000 barrels daily by the end of December.

Italy Best Buyer

Italy alone is shown as holding its position as an importer of Mexican oil. Italian takings during the month totaled approximately 430,000 barrels as compared with 457,000 barrels in October and 266,000 barrels in September.

Of the average of 23,000 barrels daily exported to the United States, the Eastern States Petroleum Company, Houston, has shown a constantly decreasing volume in the past three months. Eastern States takings for November totaled 306,000 barrels as compared with 326,000 barrels in October and 508,000 barrels in September.

Italy, through the Azienda Generale Italiana Petroli, S. A., and Eastern States Petroleum Company are the only major takers at this time.

November figures show the average daily takings of Eastern States as a little more than 10,000 barrels. Italy's daily takings for the month averaged about 14,250 barrels.

Sharp Drop From Peak

November exports of 1,095,000 barrels compare with 1,340,000 barrels in October and 1,103,000 barrels in September. The rate of decrease in exports is more clearly shown by comparison with the total of 2,332,000 barrels exported in July and 1,753,000 barrels in August, peak months just preceding the war.

Exports of crude alone in September totaled 911,000 barrels, in October 1,233,000 and in November 961,000.

Further illustration of the decrease in exports since the outbreak of the war, when shipments to Germany stopped, is found in comparison of values. For the June-August three-months period the total value of all exports was $5,146,000. For the September-November three-months period following the outbreak of war, the total value of all exports was $2,723,000.

Other Buyers

Besides the shipments to Italy and Eastern States in November, three other cargoes of crude moved out, one of 86,000 barrels by Compania Petrolera Laguna, S. A., to Japan; one of 69,000 barrels by the Mexusa Holanda to Warner, N. J., and one of 69,500 barrels by Gulf Oil Corporation to New York. A shipment of 66,000 barrels of fuel oil went to the Italian Ministry of Marine during the month.

From March 18, 1938, date of expropriation of the foreign oil companies, through November of this year, Mexico exported a total of 27,978,000 barrels of crude and petroleum products, valued at $25,000,000.

Of this, 10,000,000 barrels were exported in 1938, the remainder of 17,978,000 barrels the first 11 months of this year.

Products Shipped

These exports were divided as follows: Panuco crude, 5,072,000 barrels; Southern crude, 265,000 barrels; Isthmus crude, 865,000 barrels; Poza Rica crude, 9,493,000 barrels, or nearly 34 percent of the total volume of exports; fuel oil, 4,060,000 barrels; gas oil, 4,001,250 barrels; gasoline, 3,083,000 barrels; kerosene, 174,000 barrels; lubricants, 1750 barrels; asphalt, 963,000 barrels.

Totals of takings by different countries were as follows: Germany, 11,497,000 barrels, or 41 percent of the whole; United States, 7,254,000 barrels, or 26 percent of the whole; Italy, 4,858,000 barrels, or 17.5 percent of the whole; Scandinavia, 720,000 barrels, or 2.6 percent of the whole; Belgium, 719,000 barrels, or 2.5 percent of the whole; bunkers, 1,303,000 barrels, or 4.6 percent of the whole; other countries, 1,627,000 barrels, or 6.3 percent of the whole.

Germany's Takings

Germany's takings included 3,795,000 barrels of crude, nearly 2,000,000 barrels of fuel oil, 3,545,000 barrels of gas oil, and 1,889,000 barrels of gasoline.

Italy's total included nearly 4,200,000 barrels of crude. Of the takings by the United States, 6,408,000 barrels were crude.

Countries listed as "others" in the group importing Mexican petroleum during the period in question include Japan, Holland, France, Australia, Spain and Latin American countries.

Among companies besides Eastern States in the United States that have taken Mexican exports are: Cochrane, independent interests, from date of expropriation through November of this year, 500,000 barrels of oil; New England (Socony-Vacuum), 150,000 barrels during the same period; Empire (Cities Service), 700,000 barrels; and the Gulf, 500,000 barrels. With the exception of the Empire, these interests were not included among the expropriated companies. First shipment by the Empire was made the past June. Average daily takings by the Empire during October totaled 4500 barrels, by the Gulf 6000 barrels.

The average daily export total during the past five months has been as follows: For July, 81,000 barrels; for August, 66,500 barrels; for September, 37,000 barrels; for October, 46,000 barrels; for November 39,000 barrels.

Addition of 64,000 barrels, daily requirements for domestic consumption, gives the average daily total consumption.

Production Exceeds Demand

Comparing these totals with the average daily production, shows the daily average turned to or taken from storage as follows: For July, average daily consumption, 145,000 barrels, against average daily production of 130,000 barrels; August, consumption, 130,500, against production of 142,000; September, consumption, 101,000, against production of 147,000; October, consumption, 110,000, against production of 140,000 (estimate); November, consumption, 103,000, against production of 105,000 (estimate).

Further reduction of production is considered almost certain by the end of the year due to the rapid filling of entire storage capacity. As will be seen by the figures on average daily production and consumption, storage stocks have been steadily increasing since July, the peak month of exportation. In July storage stocks were depleted by an average of 15,000 barrels daily, but stocks were increased 11,500 barrels daily in August, 46,000 barrels daily in September, 30,000 barrels daily in October, and 2000 barrels daily in November.

Stocks at Peak

Production showed a slump in April, 1938, just after expropriation, being approximately 71,000 barrels daily for that month. But during the next five months, or through September, 1938, production showed an increase in average daily yield of 8000 barrels for each month. Excess of production over requirements during this period brought about a steady increase in storage, stocks reaching their peak figure of 17,115,000 barrels at the close of September. Production at the time was averaging around 110,000 barrels daily. This showed an increase in stocks from about 16,000,000 barrels when the government took over.

There are no accurate figures on maximum storage capacity, but very reliable estimates place the peak volume that can be stored under present conditions at 18,000,000 barrels, as previously pointed out. However, 17,000,000 barrels is considered about the extent of safe storage volume.

From October, 1938, through January, 1939, production showed a decrease in average daily yield each month of about 4000 barrels. Gradual increase in exports during this period lowered storage stocks, this situation being helped considerably by the entry of Italy into the ranks of buyers of Mexican petroleum in December.

Deliveries under the second Eastern States contract began in April, of this year, and with the deliveries to Italy, resulted in an increase in production to the September, 1938, figure. Increase in exports, paralleled by increase in production, continued through August. Then came the slump in exports by reason of the war to an average of about 37,000 barrels daily during September. Production began to fall the first of September to decline to 105,000 barrels daily average in November. Stocks increased during October and this is believed true for November.

If no new outlets are obtained, indications are production will drop to a daily average of 100,000 barrels or less by the end of the year.

Properties of a

Petroleum-Reservoir Liquid

and its Residua, with Applications of the Data to

Production Problems[1]

By KENNETH EILERTS,[2] R. VINCENT SMITH[3] and ALTON B. COOK[4]

EFFICIENT and economic production of petroleum requires knowledge of the properties of reservoir fluids and their characteristics of flow through porous formations. The change in properties and flow characteristics of fluids when their composition is altered as a result of reservoir-pressure decline is especially important in planning well-spacing programs and production schedules. Retention of the greatest possible quantity of dissolved gas in the reservoir liquid generally is recognized as essential to maximum ultimate recovery of oil from the underground reservoir. However, production methods tending to maintain gas in solution in the oil and resulting in the optimum economic recovery of oil not only vary from field to field but also may have to be changed from time to time in a given field as it is being depleted of its recoverable oil. Consequently there is need to investigate the properties of reservoir fluids corresponding to successive stages of reservoir depletion with the view of obtaining information essential to efficient production practices.

The investigation of the characteristics of a reservoir fluid and its residua has been limited to identification of the hydrocarbon samples by analysis and to measurement of those properties of each fluid that determine the energy available on expansion as a function of a change in pressure and temperature. The properties of a reservoir fluid that determine its resistance to flow through a producing formation and up the flow string in a well at a given flow rate were not measured in the laboratory; however, data for estimating the total quantities of energy dissipated when the original reservoir fluid was produced were determined in the field at several flow rates. The significance of the changes in the properties of reservoir fluid on the producing characteristics of the reservoir as depletion progresses was estimated on a relative basis, using field flow-test data obtained on the initial reservoir fluid.

[1] This article is an abstract of Bureau of Mines Report of Investigations 3474 bearing the same title. Copies of the original report containing 47 pages, including 15 figures and 15 tables, are available upon request from the Bureau of Mines, Washington, D. C. Only those tables and figures mentioned in the abstract are included in this publication.

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Field Tests

The three wells tested in the course of this investigation were on adjacent locations in a field in central Kansas. Available information indicates that the productive formation (Viola limestone) in the part of the field where the test wells are situated is substantially uniform in permeability, that the top of the formation varies in sub-sea elevation by less than 8 feet, and that water is present in the lower part of the structure.

The first flow tests were made on the discovery well in the field before the initial reservoir conditions had changed appreciably, as relatively little oil had been produced before the tests. A formation temperature of 135° F. and a static formation pressure of 1515 pounds per square inch absolute, measured at this time are believed to represent the original reservoir conditions.

Later it was determined in the laboratory on a sample prepared from separator gas and liquid that at the reservoir temperature of 135° F. the initial reservoir fluid would not liberate gas until the pressure was reduced to 1114 pounds per square inch absolute. The average gas/oil ratio measured at the discovery well in 13 flow tests for which the bottom-hole pressure was greater than 1114 pounds per square inch absolute, was 354 cubic feet per barrel. The gas measured from the separator during these 13 tests was liberated from the oil produced and not from fluid remaining in the reservoir.

A second series of flow tests was made on the discovery well after it had been tubed and treated with acid. The separator samples of oil and gas procured during this series of tests were used later in preparing a mixture estimated to have the composition of the fluid flowing from the reservoir and designated herein as the prepared reservoir fluid. A third series of flow tests, made approximately one year after the first series, included tests at four stabilized flow rates at a well one location south of the discovery well and subsurface-pressure measurements made

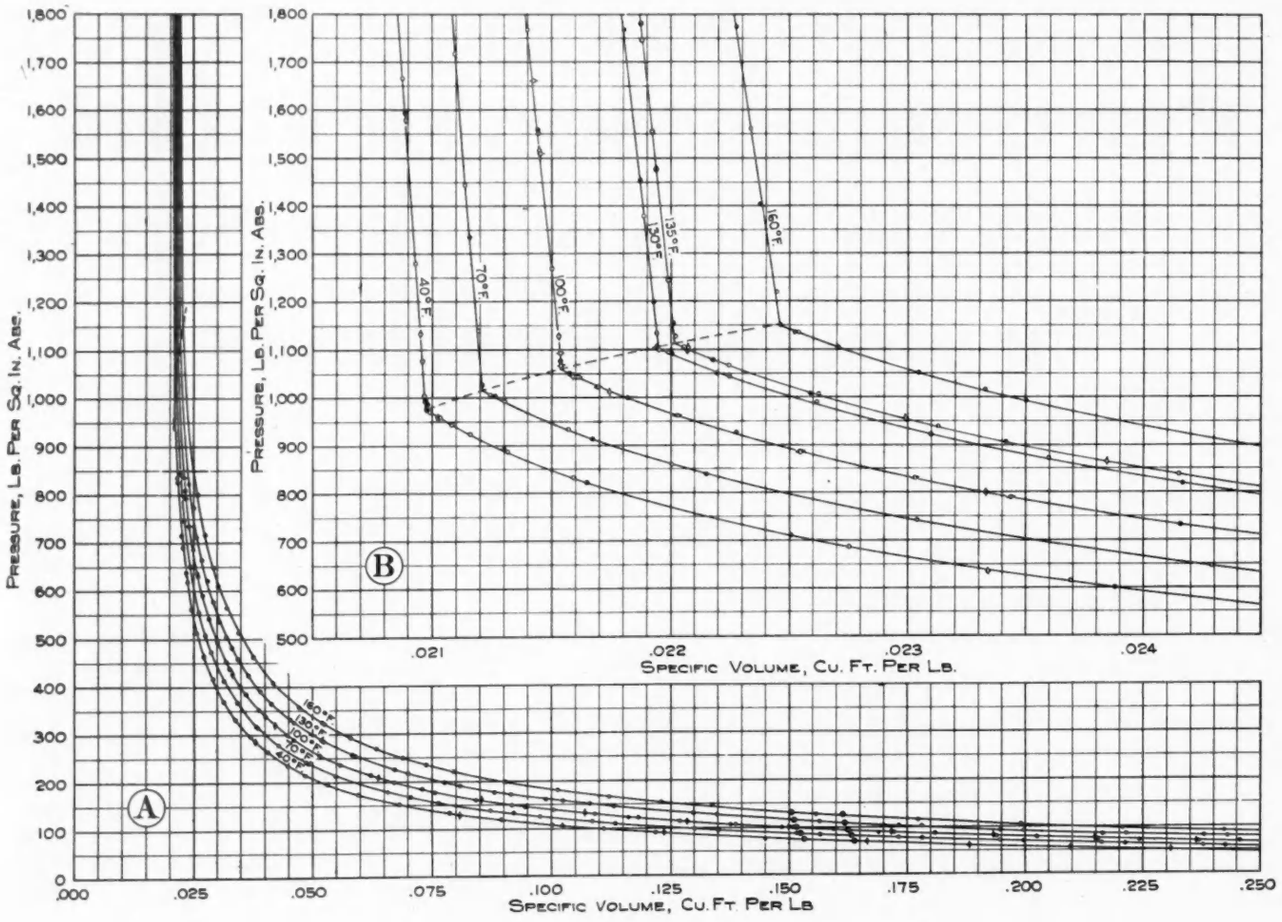


FIGURE 7

Specific Volumes of the Prepared Reservoir Fluid. A, Experimental Data for the Complete Expansion; B, Extended Volume Scale for the Region Including Saturation Pressures.

simultaneously in an offset, shut-in well 880 feet west of the second test well. The samples of fluid taken during these tests were transported to the laboratory, where certain of their properties were measured with the view of interpreting data obtained in the field.

Laboratory Determinations

The hydrocarbon samples taken included subsurface liquid, oil from the stock tank, and gas and liquid from the separator as produced under conditions of steady flow. All samples were analyzed by a low-temperature fractional distillation method. The gas and liquid from the separator were recombined in the proportions in which they were produced, as determined analytically, to provide a mixture having the composition of the undersaturated reservoir fluid. The composition of this prepared fluid is given in the first and fifth columns of Table 14.

The specific volume of the prepared fluid was determined as a function of pressure and temperature to permit evaluation of the energy available by expansion of the original reservoir liquid. The experimental data obtained are illustrated in Figure 7 (R.I. 3474). When the pressure in this reservoir is decreased to 1114 pounds per square inch absolute or lower, gas is liberated from solution, and as withdrawals continue at these formation pressures the composition and properties of the remaining liquid are changed. To determine in advance what the specific volume and other properties of the liquid residue will be, definite portions of gas were liberated successively from the prepared fluid to provide the residua designated first, second and third in Table 14. Specific volume data similar to those illustrated in Figure 7 were obtained in turn on each of these residua. The last residuum corresponds to the liquid that will be present in the reservoir when the formation pressure has been lowered to 114 pounds per square inch absolute.

Energy Available with Expansion of Reservoir Fluid

The energy available for production of reservoir fluid is given by the expression,

$$-\int_{P_f}^{P} v\,dP,$$

where v is the specific volume of the fluid at pressure P and temperature T.

The integral expresses the energy available for moving the fluid from a remote point in the reservoir where the pressure is P_f and the temperature T_f to a point nearer the well bore or up the flow string where the pressure is P and the temperature T. A line integral sign $\int$ is used because the values of specific volume required for the integration are a function of the temperature as well as of the pressure and the relation between temperature and pressure is not specified by the terms of the integral. This integral was applied to the reservoir fluid and each

residuum, assuming each fluid to expand at reservoir temperature (135° F.) from a pressure P_b, equal to its saturation pressure, to lower values of pressure as indicated in Figure 9. For the reservoir studied, P_b will be equal to P_f when the static formation pressure has declined to the value of the saturation pressure of the reservoir liquid. Assuming that thereafter the reservoir liquid will be substantially in equilibrium with the gas it liberates, P_b and P_f will be equivalent terms.

The specific-volume data obtained on the original reservoir fluid and its residua were plotted on logarithmic coordinates and extrapolated to a pressure of 14.4 pounds per square inch absolute to facilitate extending the value of the integral to that pressure.

The composition and distinctive properties of the reservoir fluid and its residua are summarized in Table 14. In general, the data presented in this table and also those relating to specific volumes may be plotted as a function of the total dissolved gas ("excess heptanes" and lighter hydrocarbons per gram of residue) and the composition and properties of intermediate residue determined by interpolation. With this information it is possible to predict the energy that will be available for producing fluid remaining in the reservoir at given formation pressures.

Applications of Laboratory Data to Production Problems

Most of the investigation covered by this report was conducted in the laboratory. However, the writers wished to demonstrate the applicability of the laboratory data to production problems, and for that purpose studies of fluid flow were made in the field. Subsurface gauges were available for measuring pressures and temperatures at any desired depth in the flow string of a producing well so that fluid-flow characteristics between the sand face in the well and the wellhead could be determined satisfactorily. The pressure gradients in the formation about the flowing well were not determined so readily because the offset wells providing access to the producing formation were not situated at the radial distances from the flowing well most convenient for this purpose. The field data obtained in this part of the investigation were relatively meager, but since laboratory data of the type obtained probably have their greatest potential usefulness in the prediction of fluid-flow characteristics in the reservoir, the information obtained from the flow tests has been used to illustrate applications of the available laboratory data and to indicate what additional laboratory studies will be necessary to solve reservoir flow problems satisfactorily. The purpose is not to report conclusions on the flow tests.

Determination of Energy Dissipated in Frictional Effects in the Flow String

When petroleum is produced by natural flow part of the energy available with expansion of the fluid is required for lifting the fluid from the reservoir to the surface, and part of the energy is dissipated in frictional effects. The magnitudes of the energy losses from frictional effects were estimated for three sizes of flow string by means of the equation,

$$-144\int_{P_1}^{P} v\,dP = h + {}_1Z_h + \frac{w_h^2 - w_1^2}{2g},$$

which applies for the flow of 1 pound of fluid, where

h = elevation, in feet, of a point in the flow string above a reference level usually the producing formation;

P = pressure, in lb. per sq. in. abs., at elevation h;

P_1 = pressure, in lb. per sq. in. abs., at the reference level;

v = specific volume, in cu. ft. per lb., of the flowing fluid at the pressure and temperature corresponding to elevation h;

${}_1Z_h$ = accumulative energy dissipation, in ft.-lb., from frictional effects over vertical flow distance h;

$\frac{w_h^2 - w_1^2}{2g}$ = energy requirement for increasing velocity of the flowing fluid (less than 1 ft.-lb. for all rates studied and therefore neglected). The velocity of the fluid is w_1 at the reference level and w_h at level h, both terms being expressed in ft. per second.

The data required for integration of this equation included pressure and temperature measurements made at different levels in the flow string under conditions of steady flow and corresponding specific-

[*Continued on Page 36*]

TABLE 14

Composition and properties of the prepared reservoir fluid and its residua obtained by isobaric phase separation at reservoir temperature

COMPONENT	COMPOSITION							
	Gm. Mols x 10³ per Gram R				Gas per Bbl. Stock Tank Oil, Cu. Ft.			
	Prepared Fluid	First Residuum	Second Residuum	Third Residuum	Prepared Fluid	First Residuum	Second Residuum	Third Residuum
Carbon Dioxide	0.019,3	0.007,9	0.001,2	0.000,0	1.82	0.74	0.11	0.00
Nitrogen	.371,1	.142,8	.020,2	.000,6	35.00	13.47	1.90	.06
Methane	1.377,1	.867,0	.411,3	.094 1	129.88	81.77	38.79	8.88
Ethane	.662,5	.555,5	.412,1	.212,1	62.48	52.39	38.87	20.00
Propane	1.292,6	1.203,2	1.072,1	.806.2	121.91	113.47	101.11	76.03
Isobutane	.253.2	.243,2	.228.6	.196.9	23.88	22.94	21.56	18.57
Normal Butane	.971.8	.947.1	.913.8	.832.9	91.65	89.32	86.18	78.55
Isopentane	.309,2	.304.2	.297.6	.280.8	29.16	28.69	28.07	26.48
Normal Pentane	.510.1	.506.1	.500.9	.487.6	48.11	47.73	47.24	45.99
Hexanes	.792,5	.788,8	.784.3	.772.2	74.74	74.39	73.97	72.83
Heptanes (excess)	.050.2	.048,3	.045,7	.039,7	4.73	4.56	4.31	3.74
Sum	6.609.6	5.614,1	4.687,8	3.723,1	623.36	529.47	442.11	351.13
Residue	4.612,5	4.612,5	4.612,5	4.612,5	.....	.....	.....	.....
Total	11.222,1	10.226,6	9.300,3	8.335.6	.....	.....	.....	.....
Physical Properties:								
Specific volume at 1515 lb. per sq. in. abs., 135° F., cc. per gm.	1.368,9	1.345,0	1.322,2	1.297,0	.....	.....	.....	.....
Reference mass at 1515 lb. per sq. in. abs., 135° F., gm. per gm. R.	1.313,7	1.288,3	1.262,9	1.229,1	.....	.....	.....	.....
Reference volume at 1515 lb. per sq. in. abs., 135° F., cc. per gm. R.	1.798,3	1.732.8	1.669.8	1.594,1	.....	.....	.....	.....
Saturation pressure at 135° F., lb. per sq. in. abs.	1114.	652.1	316.2	114.0	.....	.....	.....	.....

Simple Dynamometer Card Analysis Method

By S. B. SARGENT, Sargent Engineering Company

Pumping Series Article No. 31

It has become generally recognized that the stresses and motions involved in sucker rod pumping can be treated mathematically as a problem in vibration.

Any treatment attempting to break the problem into the fundamental and its various harmonics, however, becomes long and laborious.[1] It is the purpose of this article to illustrate a simple, rapid and general method of solving the problem.

Dynamometer cards taken on the surface at the approximate position of the polish rod are quite prevalent in the oil industry. The principal difficulty encountered in their application has been a rapid, simple, and adequate analysis. The analysis offered herein must be taken only as another approximation and not as a concise device explaining everything.

As in all dynamical analyses we are interested in three variables—force, time and mass. This method is predicated on the use of a dynamometer which records all three of these variables in one form or another.

Timoshenko gives the following expression:

$$x = 1/p \int q \sin p\,(t_1 - t_2)\,dt$$

Where x is the displacement of the end of the rods in an interval Δt, p is the angular velocity of the natural frequency of the rods, q is the force per unit mass, and t represents time. If we have the expression of the integral on the right side of the equation in the form of a graphical relation between t and q we may integrate mechanically and determine x.

Figure 1 shows force plotted as a function of time, as determined by a dynagraph. The area under the curve is integrated for small intervals of time and: is in this case one unit of cross section.

This displacement is added vectorially to the walking beam motion, which gives the motion of the plunger in moving space. If the tubing is anchored the resultant motion is the motion of the plunger with respect to the working barrel.

The actual mechanics of the method involves a recognition of the fact that the stress recorded by the dynamometer varies with depth as the sine or cosine function of $\frac{\pi x}{2}$ where x is the distance from the dynamometer to any point in the string. Therefore, the average force is to be multiplied by $\frac{\pi}{2}$ to obtain the maximum force. It should be further borne in mind that the location of the point of maximum stress in the string is determined by the mode of vibration of the rods. That is to say, the rods will vibrate either as a prismatic bar with one end fixed, or as a prismatic bar with free ends, depending on the type of prime mover. The mode of vibration which they assume determines the location of the point of maximum stress. Correction must be made for the location of the dynamometer on this basis.

In actual practice the curve may be integrated and the vectorial addition, to the walking beam motion, may be made by proportional dividers.

An approximation of the subsurface dynagraph card is shown alongside of the break-down of plunger motion. The method of construction is obvious as to the location of the various points of change. They are located by drawing parallel lines from the corresponding points on the plunger motion card.

The method is simple, rapid, and seems to indicate a reasonable answer. Its value is limited to wells where the tubing is reasonably well anchored. In cases where the tubing is not anchored, it is necessary to take a dynamometer card on the tubing, and add vectorially the motion of the working barrel.

[1] See following papers:

"Investigation of Oil Well Surface Dynagraph Cards," by S. B. Sargent, R. W. Rieniets, and R. E. Ball, April, 1939, meeting of the American Society of Mechanical Engineers at New Orleans.

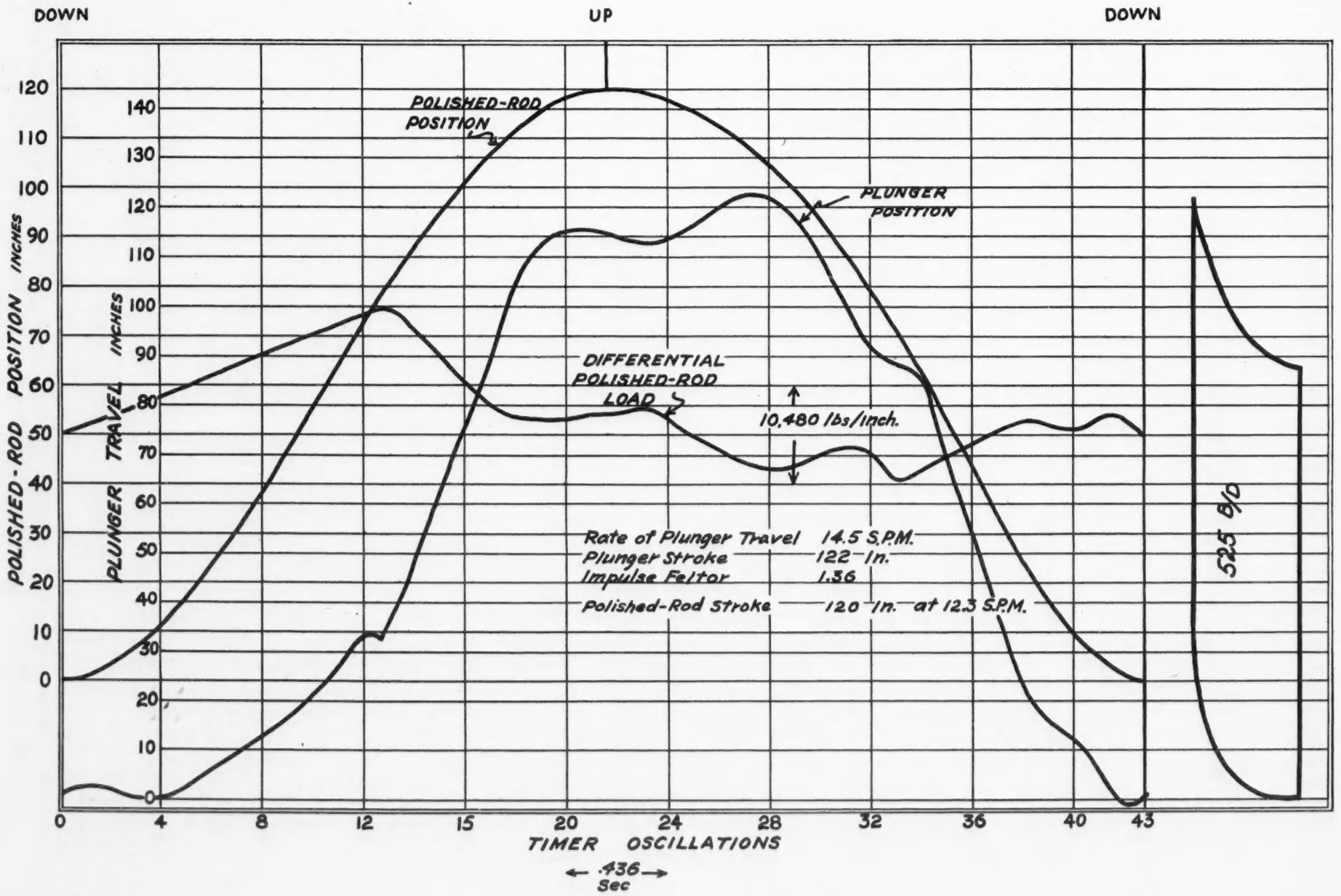
"Plunger Travel of Oil Well Plunger Pumps," by Robert William Rieniets, June 3 and 4, 1937 meeting of American Petroleum Institute at Colorado Springs.

"Vibration Problems in Oil Wells," by J. C. Slonneger, June 3-4, 1937 meeting of American Petroleum Institute at Colorado Springs.

"The Cycle of an Oil Well Plunger Pump," in November, 1926, issue of Oil Field Engineering.

"The Sucker Rod Pump as a Problem in Vibrations," by John Kendrick and P. D. Cornelius, 1936 meeting of the American Institute of Mining and Metallurgical Engineers in Fort Worth.

"Vibration Problems in Engineering," by S. Timoshenko, book published by D. Van Nostrand Company, Inc., 130 Church St., New York.


DOWN
UP
DOWN
POLISHED-ROD POSITION
PLUNGER POSITION
DIFFERENTIAL POLISHED-ROD LOAD
10,480 lbs/inch.
525 B/D
Rate of Plunger Travel 14.5 S.P.M.
Plunger Stroke 122 In.
Impulse Factor 1.36
Polished-Rod Stroke 120 In. at 12.3 S.P.M.
POLISHED-ROD POSITION INCHES
PLUNGER TRAVEL INCHES
TIMER OSCILLATIONS
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Heaving Shale Research Program Is Instituted

IT has been recognized generally that the problem of the so-called "heaving shale" as encountered in drilling wells, particularly in the Gulf Coast areas, may be attacked from several angles.

A summary of the findings of an engineering committee which met at various times last year indicates that the problem may be classified into several distinct divisions, such as the following:

1. Regional Studies
   a. Trends
   b. Tectonics
   c. Structures
2. Types of Heaving Shale
   a. Lithological Composition
   b. Chemical Composition
   c. Physical Properties
3. Causes of Heaving Shale
   A. Natural Causes
      a. Inclination of strata and uplifting processes
      b. Hydration of bentonitic shales
      c. Gas
      d. "Plastic flow" at depth
   B. Artificial Causes
      a. Excessive pressure differentials developed during drilling operations
      b. Negligence
      c. Operational and mechanical
      d. Miscellaneous
4. Combatting Heaving Shale
   a. Drilling Muds
      1. Heavy muds
      2. Chemically conditioned muds
   b. Mechanical and operational
   c. Miscellaneous.

The above outline is by no means complete, but will serve as a starting point upon which the University of Texas will base a research program on heaving shales. The University is trying to build this research program up from a consideration of the more elementary fundamentals, and hopes to eventually tie these concepts in with the more complex shales met with at troublesome wells and with the other difficulties experienced in the field. And, it is to be hoped that this small initial effort may lead in future years to a research program that will study the whole problem in all its various aspects.

The research program will be conducted by Charles R. Houssiere, Jr., who was graduated in petroleum engineering from the University of Oklahoma and has recently received a master of science degree in chemical engineering from the Massachusetts Institute of Technology.

Water penetration into the bentonitic layers appears to be a function of the distance between the layers of bentonite mineral lattices, if present. Any operation, such as the removal of drill pipe, temporarily reducing the pressure at the point of drilling, may cause "heaving" or "sloughing" into the hole by reason of the differential pressures created between the formation and the hole. Some have recommended the use of heavy mud. A later approach involves the use of chemically conditioned mud and especially muds with suitable wall building qualities. It is believed by others, and probably with reason, that the difficulties met in this problem are purely mechanical and can be solved by the application of cautious drilling procedure. It is difficult to term an area a "heaving shale" area today, for by tomorrow's improved drilling methods we may eliminate the trouble. Areas that were considered hazardous in years gone by now offer little trouble with the improved practices of modern drilling methods.

Nevertheless, even though tomorrow may find new mechanical methods there is still much work necessary to attack the problem from the physico-chemical characteristics of the mud fluid and the formations drilled. A combination of the two factors might result in much more desirable methods of penetrating these unstable formations.

It has long been known in the ceramic industry that the colloidal characteristics were in a large manner the controlling properties to be considered in the proper manipulation of a clay for plastic purposes. The effect of different chemicals on the plasticity, viscosity, shear-strength and other factors has long been noted, and until recently, in only an empirical manner. With the application of colloidal theory, a general explanation of the above effects was given, and a closer control of the desirable characteristics was obtained.

The attack of the heaving shale problem will therefore be undertaken from the foregoing standpoint. A thorough basic analysis of the basic minerals found in these shales will be made, both from the standpoint of percentage composition, as well as from the viewpoint of colloidal reactions. Having understood the result of these investigations, it is planned to obtain comparatively shallow samples of what is termed "heaving shale," and a basic analysis of these will also be made along the same lines as the above mentioned investigations.

For a proper understanding of this difficulty, it is first necessary to understand the properties of the materials with which we are dealing. It seems logical that a thorough search of the literature of "soil science" might suggest an analogy to underground conditions. Generally speaking the formations with which we deal at oil-well depths, were formerly exposed to the atmosphere and elements of nature as they were laid down as sediments. Strictly speaking, the only other conditions which buried sediments have been subjected to are those of pressure, temperature, and dissolution of or precipitating of minerals by the ground waters which percolated through them.

If an analysis of the minerals in these shales can be made to any degree of accuracy, if the ions adsorbed on the system can be determined quantitatively, and if a particle size determination can be made of the colloids present, then correlation might be possible with

the characteristics determined from the pure minerals.

The general procedure, therefore, will be to make a particle size analysis of the pure minerals in the colloidal form in which they are present. The system containing many different diameter particles will be fractionated into as many different mono-dispersed parts as possible, in order to obtain little deviation in particle size. The ionic effect, the base-exchange effect, and the quantitative mineral composition of all the mono-dispersed systems will be determined. A mixture of different mono-dispersed systems will be studied and correlations made, if possible, to determine what empirical and theoretical laws may be developed.

Then, having done this, a similar procedure will be run on the heaving shales obtained at shallow depths. The congruencies and incongruencies will be determined by checking with the results of the pure minerals and explanations of the deviations will be attempted. These explanations will be studied further to either establish them or prove new ones.

[1] The use of "bentonite" and "bentonitic material," refers to those minerals which show swelling properties.

Once having determined the chemical behavior of these shales and pure minerals, the next step will probably be to determine the mechanical strengths of all the samples tested. It is believed that correlation between base-exchange and various chemicals added can be made with relation to mechanical strength. The mechanical-strength questions to be answered are those of vertical load before horizontal shear, angular load before horizontal shear, and horizontal load before horizontal shear.

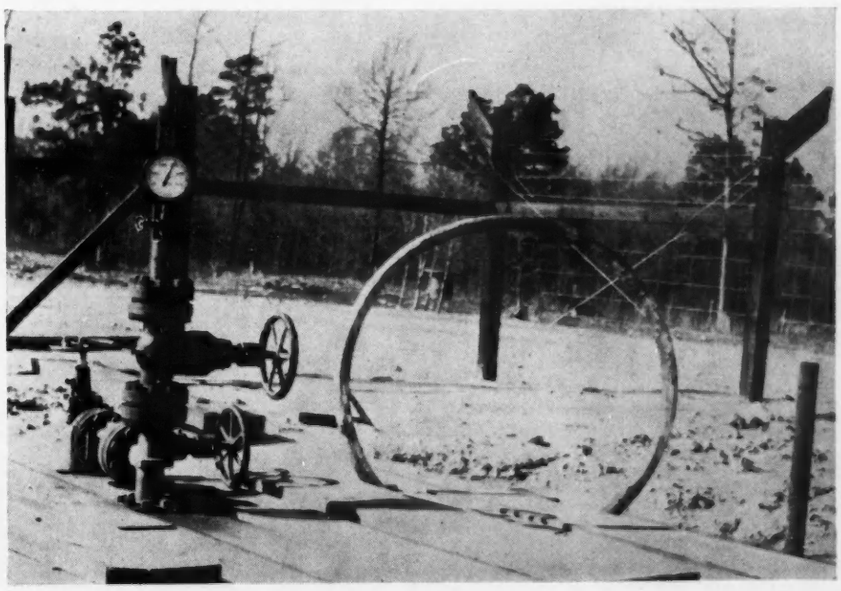
It is, of course, understood that it will be somewhat difficult to determine the bentonitic[1] composition of the heaving shales accurately. Therefore, if shales which are known to contain no bentonitic material, are carefully selected and mixed with a predetermined amount of this bentonitic material further mechanical tests might be enlightening. It is admitted that natural "in-place" characteristics as far as close-packing is concerned, might not be closely approximated. However, if a general procedure is followed for every sample prepared, at least, a related correlation will be obtained.

It is known that certain ions are more hydrated than others. It is also known that certain ions have different diameters. The smaller the diameter, generally speaking, the more easy it is for the ion to slip into the expanding lattice of the bentonitic material. It might be that the real difficulty in heaving shale is not a swelling, but a dissolution of the colloidal material in such a way as to lubricate the bedding planes of the non-colloidal material and cause a plastic-like formation to result. This type formation would naturally have no mechanical strength to speak of, and might explain the reason for finding accumulations way up in the open hole after drilling has ceased and drill pipe removed.

From the work outline, it is evident that a long-time program is in store. It is hoped to obtain as simple a solution as possible to this problem. Certainly the circumstances under which "heaving" takes place are not too complicated, at least from the surface viewpoint. It appears to be mostly a question of the effect of the dispersion medium on the formation, which, up to now has been unexplainable.

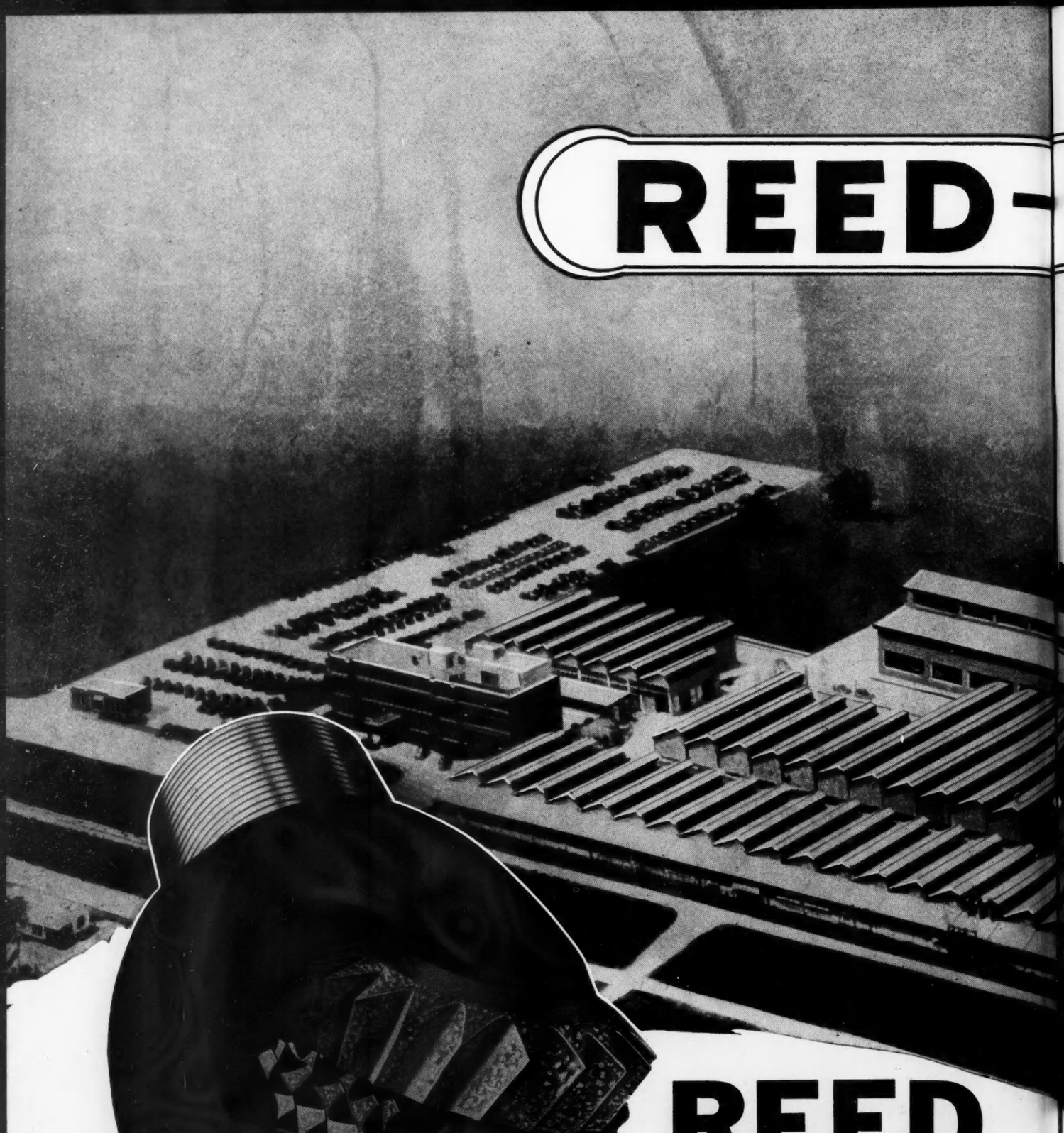
Flow-Line Loop Snubs Gas Well Pressure

ADEQUATE provision for expansion and contraction, as well as absorption of vibration incident to flowing a high-pressure gas and distillate well is observed at the Humble-Gulf well east of the East Texas oil field. The flow line is brought away from the well in the conventional manner, then led through a complete circle in the pipe, with the two tangent sections touching and the point farthest from them supported with guy wires to prevent sidewise strain.



When so tied in, the line to separator from well can expand or contract through a wide range without adding strain to the wellhead connection, while any pulsation in flow occasioned by putting the well on is also dampened by the full circle of pipe so that no undue load is placed on any connections or fittings.

Installed vertically instead of being laid horizontally, the behavior of the loop may be watched and a close check kept on the forces which otherwise would be imposed upon the pipe in addition to the high flow pressures from the gas flow.



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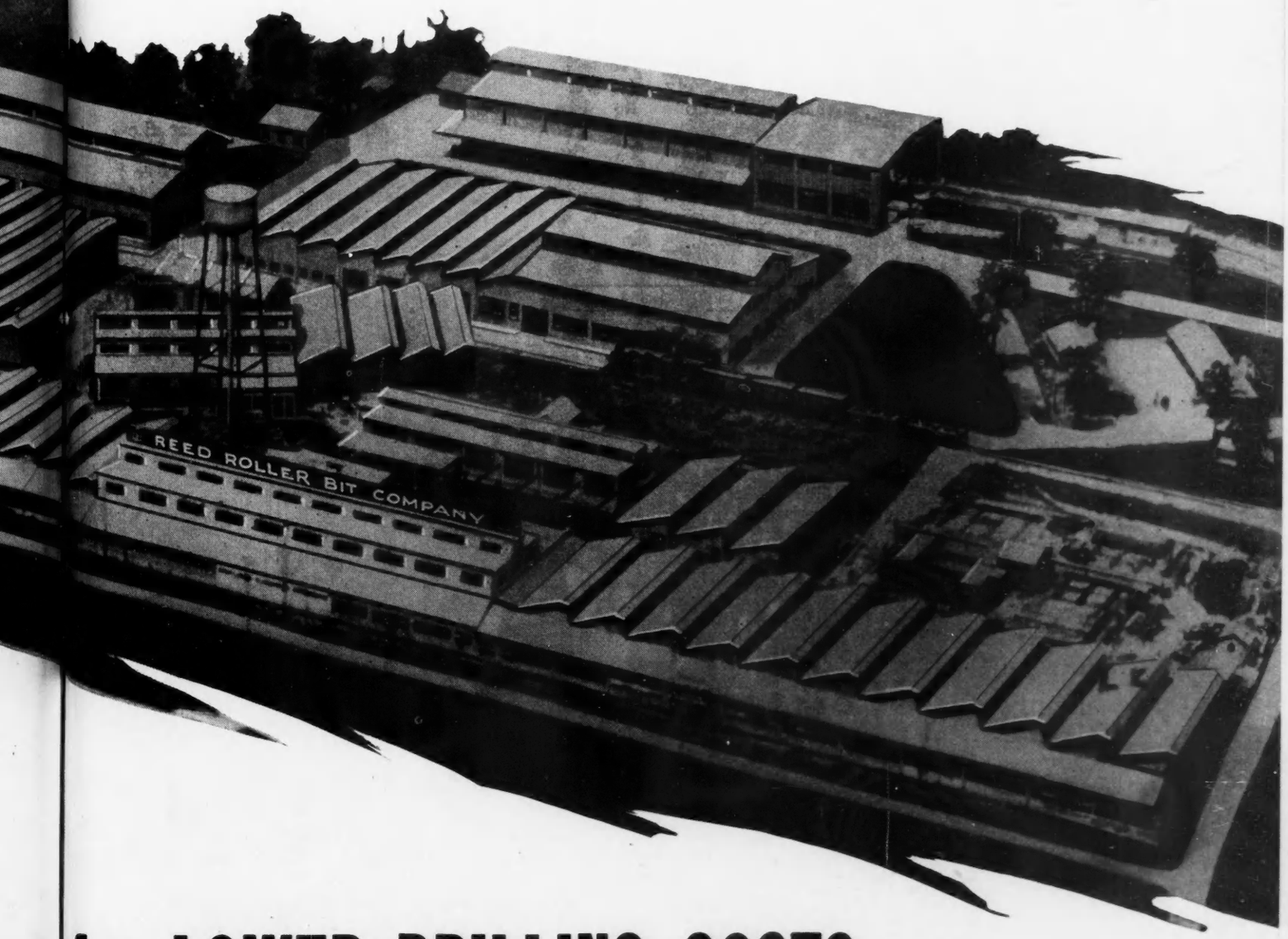

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volume data obtained in the laboratory. The results of computations for six rates of flow are illustrated graphically in Figure 11, which shows that the losses to the surface for flows through 8¼-inch casing average more than three times the average frictional losses for the tubing to the same point. It is believed that relatively greater slippage effects and accumulation of liquid phase in the casing explain the relatively greater expenditure of energy. Whatever the explanation may be, the indication is that a well will produce this fluid longer by natural flow through tubing than it would through casing of larger diameter; this condition is corroborated by results in producing fields.

Estimation of Radial Pressure Gradient in Producing Formation as a Function of the Flow Rate

The data obtained in the flow tests, involving formation-pressure measurements at two wells with only one flowing, were not adequate for exact analysis, and to facilitate an illustration of the possible application of data obtained in the laboratory the following mathematical treatment was reduced to relatively simple expressions by assuming that flow conditions in the reservoir were ideal.

It was assumed that the productive formation about the flowing well was in effect uniform in permeability and thickness and that a state of viscous flow existed at all liquid-production rates. An equation expressing Darcy's law was used in the form,

$$\frac{mv}{2\pi Rt} = \frac{k}{\mu}\frac{dP}{dR} \quad \ldots\ldots\ldots\ldots\ldots\ldots (1),$$

where R = radial distance from flowing well;
P = formation pressure at distance R;
v = specific volume of the fluid at pressure P;
μ = viscosity of the fluid at pressure P;
m = mass of fluid produced by the well in unit time;
k = permeability of the formation;
t = thickness of the formation.

When the sand-faced pressure at the flowing well was P_s, the formation pressure at a distance, R, was determined through integration of the equation,

$$\frac{m}{2\pi t}\int_r^R \frac{dR}{R} = \frac{k}{\mu v}\int_{P_s}^{P} dP \quad \ldots\ldots\ldots\ldots (2),$$

where r is the effective radius of the flowing well on the basis of complete penetration and the specific volume and viscosity of the flowing liquid are treated as being constant. Integration of this equation gave,

$$P = P_s + C \log (R/r) \quad \ldots\ldots\ldots\ldots\ldots\ldots (3),$$

where, $$C = \frac{2.303m}{2\pi t}\left(\frac{v_o \mu_o}{k_o}\right) = \frac{P_{880} - P_s}{\log (880/r)} \quad \ldots\ldots (4).$$

In applying these equations to the reservoir flow tests the subscripts were used in the expression $(v_o\mu_o/k_o)$ to indicate the values of the respective liquid properties and the value of the effective permeability of the formation to the liquid, at the time the flow tests were made. The actual values of the viscosity and permeability were not available, however, and values of constant C were determined for each flow rate, using the measured difference in formation pressures between test wells 880 feet

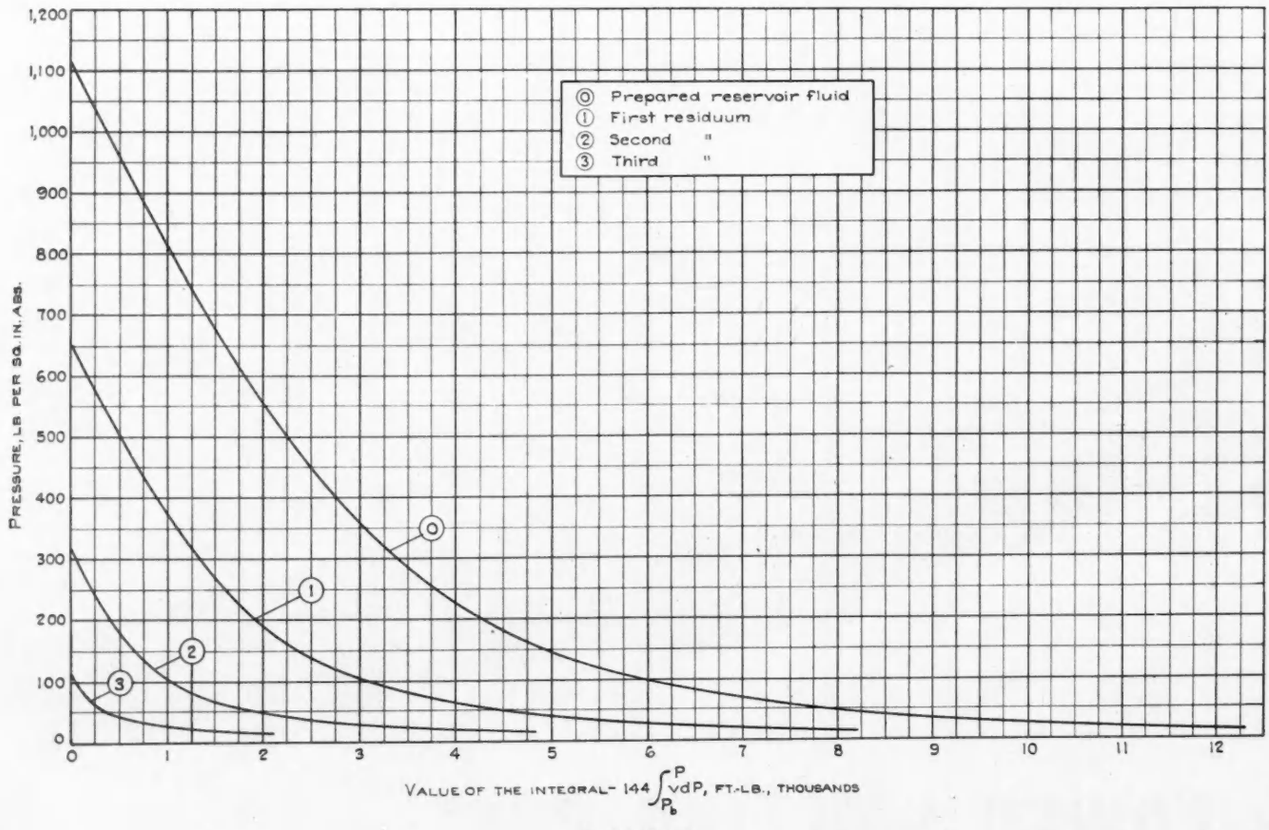


FIGURE 9

Energy Available with Expansion of One Pound of Fluid at Reservoir Temperature (135° F.) From Saturation Pressure (P_b) to Indicate Values.

apart. The data obtained in the field were evaluated by means of the equations.

Flowing well, $P_f - P_s = 1.600\ Q$ .....(5)
Offset shut-in well, $P_f - P_{880} = 0.468\ Q$ .....(6)
Difference, $P_{880} - P_s = 1.132\ Q$ .....(7)

where Q is the flow rate, in bbl. per hr., at the flowing well; P_f the static formation pressure; P_s the sand-face pressure in the flowing well; and P_{880} the sand-face pressure in the offset well. The measured value of the static formation pressure P_f (1,326 lb. per sq. in. abs. at the time of these tests) was substituted in equation 5, and equations 3, 4, 5, and 7 were combined to obtain,

$$P = 1{,}326 - 1.600\ Q + 1.132\ Q \frac{\log (R/r)}{\log (880/r)} \quad \ldots\ldots (8).$$

The curves in Figure 13 indicate the pressure gradients (plotted as functions of production rates) necessary for flowing the well when the reservoir fluid being withdrawn is approximately in its original state. Later in the productive life of the field when the gas in solution in the reservoir liquid has decreased, the pressure gradients for given production rates will change. Maximum economic recovery of oil from a reservoir depends on the time allowed for ultimate production and the investment in equipment as well as on the total ultimate yield of oil. It is important, therefore, that engineers consider possible changes in the properties of reservoir fluids that will take place during the producing life of a field before attempting to plan a well-spacing program designed to bring about results that are specifically desired.

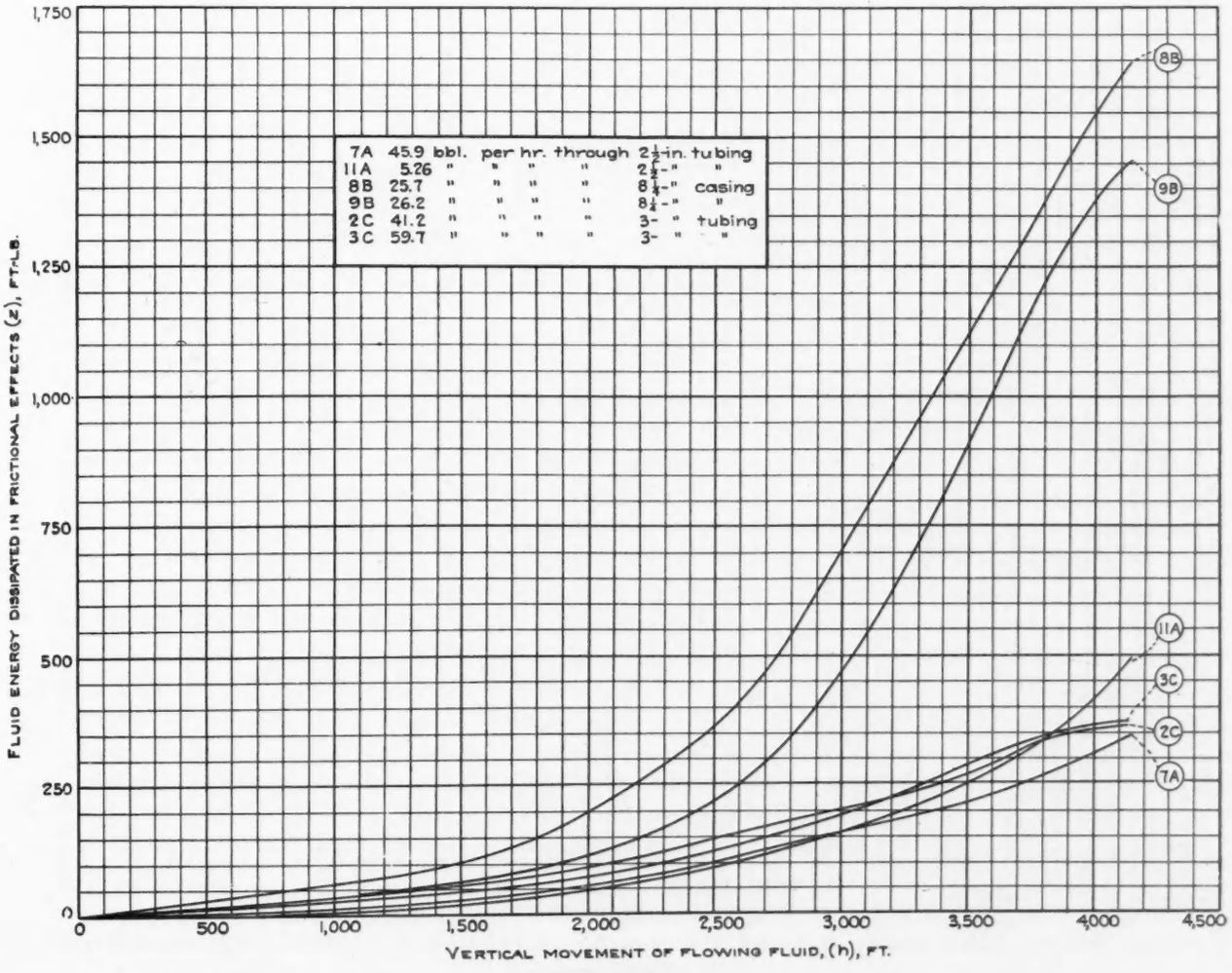


FIGURE 11
The Cumulative Energy Losses Due to Friction in the Flow String at Indicated Production Rates.

As the effective radius of the well bore was not determinable because the well had been acid-treated, values of r equal to 0.25, 1.0, and 4.0 feet were used as parameters in the solutions of Equation 3. The pressure gradients illustrated in Figure 13 were computed from Equation 8 by making r equal to 0.25 ft., which was the approximate original radius of well bore at the sand face. Although these curves are extrapolated one additional well location as a matter of interest, it is not implied that Equation 8 is suited for this purpose. The principal object was to interpolate the formation pressures between the wells under test.

Summary

Methods for determining properties of a reservoir fluid that are of particular significance to production practice have been developed. The equipment and procedure essential to the methods have been des-

cribed briefly, and the data obtained from a typical reservoir fluid are presented. Practical applications of the data are illustrated, and suggestions are made regarding the additional information necessary for important extensions of the applications.

Apparatus developed include: A steel pycnometer for measuring the specific volume of fluids having high vapor pressures; a simplified variable-volume cell for determining the expansibility of fluids under conditions of phase equilibrium; and a fractional-

ured in a shut-in well offsetting a flowing well were applied to interpolation of the pressure gradients through the oil-producing structure at four rates of flow. The effect of changing fluid properties on the values of the gradients and the significance of the change in limiting withdrawal rates are discussed.

A development of particular interest to the petroleum technician is the analytical method described for comparing the compositions and other properties of hydrocarbon liquids obtained at different points

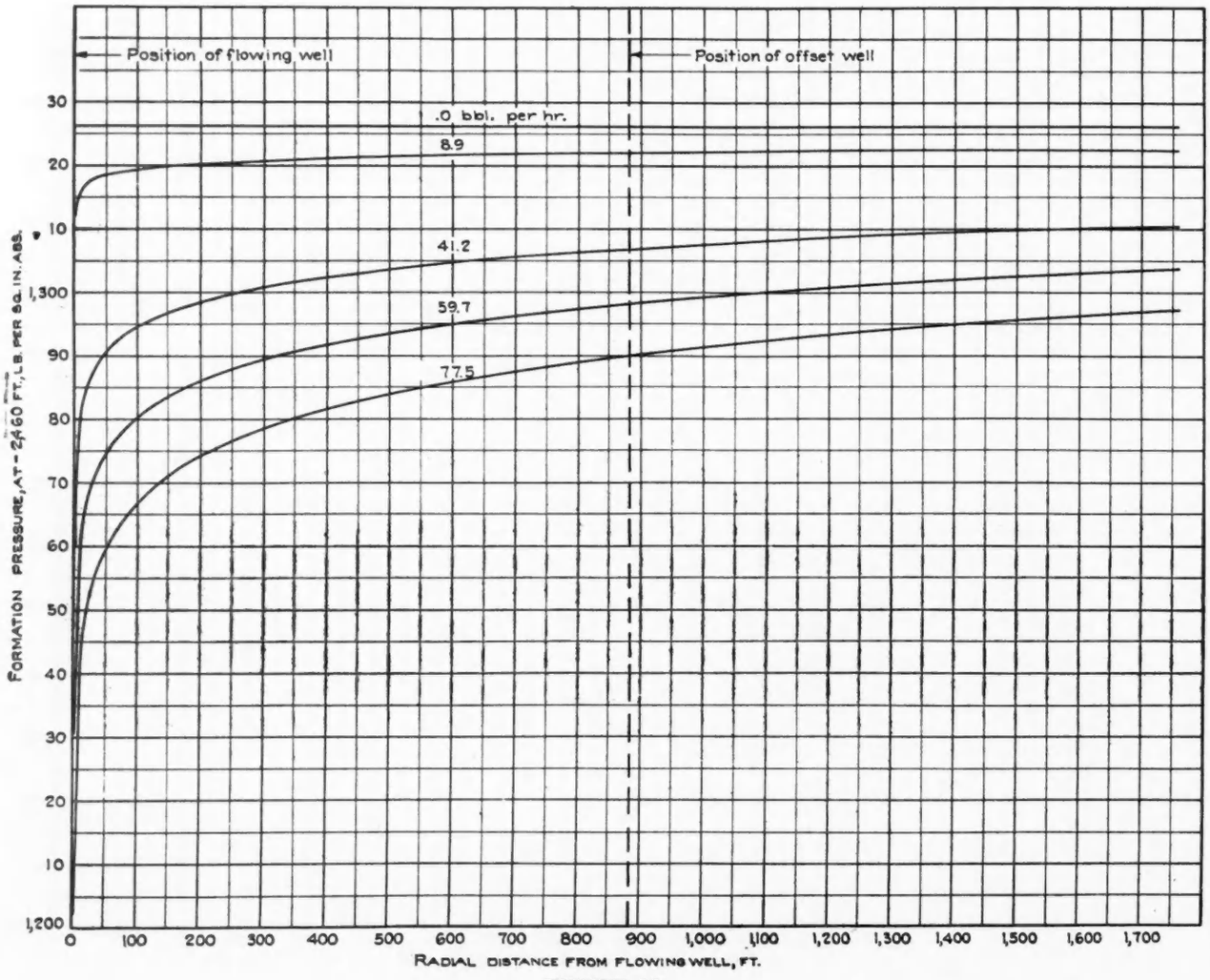


FIGURE 13

Estimated Pressure Gradients in Formation Between Flowing Well and Offset Well, the Flowing Well Assumed to Produce from 6-Inch-Diameter Hole.

distillation assembly for analyzing the gas and liquid-hydrocarbon samples.

Analytical data are presented on a complete set of gas and liquid samples taken during a well flow test. The composition and properties of a prepared reservoir fluid and three of its residua obtained by liberation of dissolved gas are given. Isotherms were determined for the fluids in 30° F. intervals for the pressure range from 3,000 to below 50 pounds per square inch absolute.

The loss of energy from frictional effects was evaluated for two fluid production rates in each of three sizes of flow string. Subsurface pressures measin the flow stream. The amount of gas liberated from liquid solution and the resultant volume change in the solvent can be determined without knowledge of the pressure and temperature gradients and the type of liberation in the flow stream between the points at which the samples were taken. Production engineers are concerned with the decrease in energy that occurs as reservoir pressures decline because the methods and rates of recovery depend on this factor. The energy available by expansion of reservoir fluids having compositions corresponding to three stages of depletion were estimated from experimental data obtained from residua of the original fluid.

[*Continued from page 15*]

double the imports of 33,735,000 barrels; 15.4 percent of the imports were in bond for re-export, had no effect on domestic trade. The export total is 4.7 percent under 1938 while imports rose 27.7 percent.

Crude-oil prices, as indexed by the 36-degree Oklahoma-Kansas price, remained at $1.02 a barrel throughout 1939; no estimates of the country-wide average per-barrel price are available, but it is expected to be lower than the 1938 average, $1.13.

Wholesale prices of petroleum products again were lower than any others reported by the U. S. Bureau of Labor Statistics; the estimated 1939 index, based on 1926 as 100, was 52.0 for petroleum products compared with an all-commodity average index of 76.7.

Average retail gasoline price of 13.30 cents a gallon in 1939 was a six-year low. State, federal, and local taxes averaging 5.44 cents a gallon and equiavlent to a 40.9 percent sales tax, obscure the industry's progressive savings to consumers. Total average cost, including taxes, was 18.74 cents a gallon.

Total 1939 gasoline-tax collections from consumers are believed to have reached $1,029,000,000, being the first time the total has passed the $1,000,000,000 - mark. The states collected $812,000,000, the federal government $217,000,000. Other petroleum taxes, whose numbers total more than 200, are expected to raise the 1939 petroleum tax bill on the industry and its customers to $1,335,000,000, about $50,000,000 more than in 1938, and the largest levy in the industry's history. These taxes totalled more than four time the industry's earnings, and accounted for more than 10 percent of all taxes levied in the nation.

The average motorist, who used about 732 gallons of gasoline in 1939, thus paid only $97.36 for fuel, $3.50 less than he paid in 1925 for 230 fewer gallons. Tax costs in 1939, however, were four times as great, and the average motorist paid $39.82 in gasoline taxes, 29.0 percent of his total fuel bill of $137.18.

Oil's Prospects for 1940 Best in Many Years

By ERNEST O. THOMPSON, Chairman Interstate Oil Compact Commission

THE oil industry is going into the new year 1940 with the best prospects it has had in many years.

Stocks of crude above ground have been reduced from a high of 450 million barrels to a low of around 230 million barrels. This in my opinion is as low as economic operation will allow. It might be possible to have uninterrupted operation of refineries with slightly lower stocks of crude if the stocks of crude and the stocks of gasoline were properly distributed. But this could never come about except under an undesirable, and to us in America, an intolerable totalitarian Fascist or Nazi Government.

It is desirable and necessary in a Democratic Government, and a profit motivating industry that we do not have perfection.

The constant competition between crudes and between fields and areas and the competition between states and even between countries is good for everyone concerned.

It must always be kept in mind that every division of the oil industry from the land owner, the producer, the royalty owner, the refiner, the transporter to the marketer are all in business to serve the consumer.

There are more consumers than there are producers, royalty owners, pipe liners, refiners and marketers. The consumer will finally prevail if he be not given the full benefit of every possible advance of science and saving. The consumer is entitled to have his motor fuel produced, refined and marketed by the most advanced and most efficient known methods. Old inefficient, wasteful methods cannot longer prevail. The consumer acting through his state government's police power will stop waste in production of oil and gas.

The profit motive in a free competitive field will compel the adoption of the most efficient methods and practices in the refining, transporting and marketing branches of the industry.

This is all the control that is needed in the oil industry. Any further control by government is unnecessary and undesirable. Any further control by government would be a change in our form of democratic government.

It is more important that we preserve our American form of government with its dual form of state and federal governments, each sovereign in its separate sphere of action, than it is to achieve somebody's idea of engineering or scientific perfection.

As between the two it is far better to tolerate a little waste in oil production than to give up our freedom of our sovereign states to control their production within their own state borders. The waste can be finally prevented, but once our state sovereignty is surrendered even one iota, we have forever lost the most precious thing on earth to the proud citizens of our sovereign states.

There is something in this world far more desirable than cold efficiency. It is freedom.

Our American form of dual sovereignty with state and federal governments each having inviolate their separate fields of action. With church and state each separate. With the right of worship according to one's own conscience. With the executive, the legislative and the judicial branches even of each state and federal government free and separate and under no dictation by the other branches of the government. These are the important things to preserve at all costs.

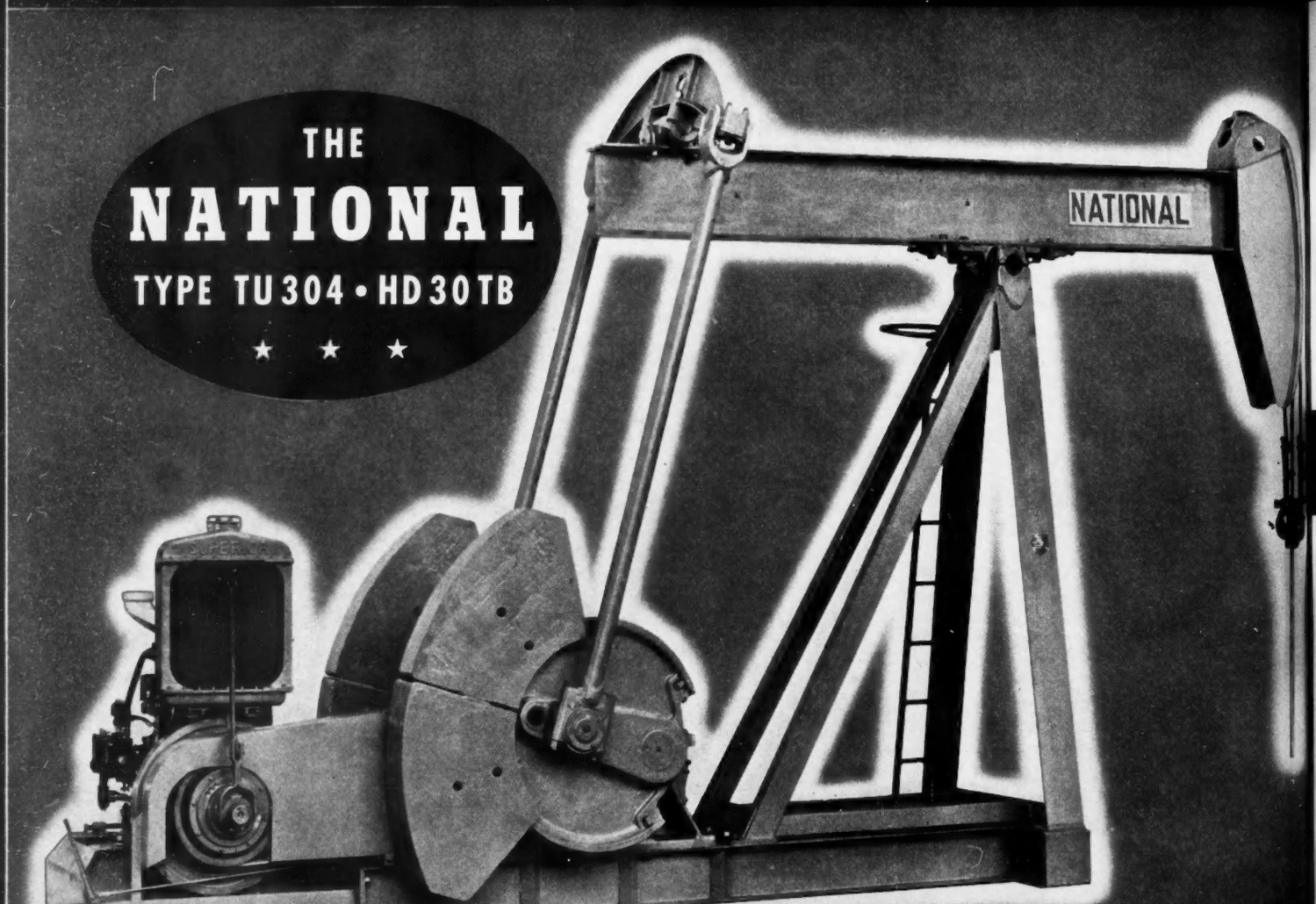
These things—these rights, these checks and balances in government, this protection of the citizen from an ever encroaching central government, are the result of the experience of the ages.

We were thousands of years evolving this form of freedom under democratic government.

The action of tyrants and dictators brought about the creation of the American government.

It was carefully and thoughtfully planned and designed to keep the power of the government close at home. It has succeeded better

A *New* NATIONAL



BRIEF SPECIFICATIONS

API safe load of walking beam, pounds	12750
Polished rod strokes, inches	33, 40½, 48
Maximum counterweight effect at maximum polished rod stroke, pounds	8480
Over-all counterweight swing, maximum, inches	48
Reduction Gear:	
API peak torque rating at 20 spm., inch pounds	76500
Over-all gear ratio	29.6
Crankshaft diameter at bearings, inches	5
V-belt sheave pitch diameter, inches by number and section of belts	18x4C
V-belt sheave pitch diameter, maximum, inches	26
Well end working centers	6'0"
Length of base	11'7"
Width of base, inches	27¾"
Width of base at Samson post, inches	52"
Height bottom of base to top of beam	11'2"
Walking beam size and weight, CB section	16" x 58 lbs.
Wrist pins, tapered, large diameter by length, inches	2¾ x 4⅝
Weight, regular equipment less extension base and counterweights, pounds	8100
Weight, RK-36 crank counterweights, each	1225

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THE NATIONAL

UNIT PUMPER...

THE Type TU304-HD30TB National Unit Pumper is compact and strongly built with all the features essential to the efficiency and long life yet it is economical in first cost.

It follows the same general design as the larger National Unit Pumpers and has National Eccentric Disc Cranks and Counterweights and Herringbone Type Reduction Gears.

Among features important to performance are centralized beam lubrication, fully equalized pitman assembly, automotive type service brake and walking beam adjustment.

The addition of this new pumper to the National Line makes it easier for an operator in the medium service fields to select a unit exactly fitted to his needs.

For complete details on this new Unit ask for Bulletin No. 260.

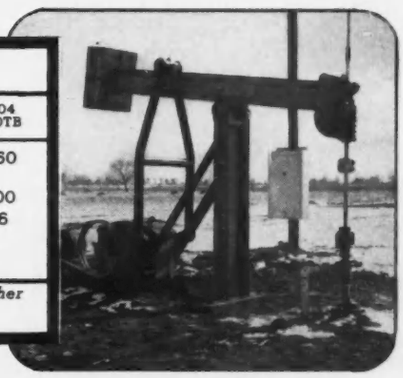
THE *NATIONAL* LINE OF UNIT PUMPERS

6 TYPES FOR LIGHT AND MEDIUM SERVICE

BRIEF SPECIFICATIONS

	TU20G -JD2TP	TU70G -JD7TP	TU140G -JD14TP	TU234G -JD23TP	*TU234 -JD23TB	*TU304 -HD30TB
API Walking Beam Rating, lbs.	3000	4000	6170	9125	9125	12750
Peak torque rating API inch lbs. at 20 spm	5400	17900	36800	57200	57200	76500
Over-all gear ratio	26.0	24.9	24.9	29.8	29.8	29.6
Maximum polished rod stroke, inches	15	24	32	42	42	48

**Equipped with National Eccentric Disc Cranks and Counterweights—other sizes have beam type counterweights.*



6 TYPES FOR MEDIUM TO HEAVIEST SERVICE

BRIEF SPECIFICATIONS

SINGLE REDUCTION TYPES / DOUBLE REDUCTION TYPES	TU403-H40T TU403-HD40T	TU403-H60T TU403-HD60T	TU603-H60T TU603-HD60T	TU603-H80T TU603-HD80T	TU803-H80T TU803-HD80T	TU803-H110
API Walking Beam Rating	11750	11625	18850	18750	24000	24000
Single Reduction Type:						
Peak torque rating inch lbs. at 20 spm	124000	170000	170000	238000	238000	303000
Over-all gear ratio	10.2	9.7	9.7	9.4	9.4	9.32
Double Reduction Type:						
Peak torque rating inch lbs. at 20 spm	98500	139000	139000	200000	200000	----
Over-all gear ratio	29.8	26.8	26.8	28.3	28.3	----
Maximum polished rod stroke, inches	48	54	54	64	72	72

All the above types are equipped with National Eccentric Disc Cranks and Counterweights.

NATIONAL SUPPLY COMPANY

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than any form of government on earth.

Let us not place in jeopardy our proven form of government or change it just because somebody is not producing oil or gas as efficiently as some theorist would desire or compel if he had the power.

I do not admit that the federal government could do any better job of preventing waste in oil and gas production than the states are doing.

The states are fast learning how to prevent physical waste. Those states who do not now have waste prevention laws will soon have them. Informed public opinion within the states will compel it. That is a task of education within the states. Abuse will not do the job.

The whole science of producing oil so as to prevent avoidable waste is new. We should not get all in a dither over such a newly discovered and highly controversial science or technique.

If the federal government thinks it needs some oil for naval or army reserves then let the government buy outright some complete oil field of ample reserves of proven production and shut that field in completely and hold it against the need.

The natural reservoir in the earth is the best and safest storage tank. No one could touch it or waste it through the ages.

The government buys gold and buries it in Kentucky for a reserve. Why not buy an oil field and keep the oil in the ground for a defense reserve?

That is exactly what the government did at Amarillo, Texas, in the helium gas producing field. The government thought it needed helium reserve, so the congress made an appropriation and the government bought outright fifty thousand acres of helium gas producing land and are now holding it against the need.

Oil is not the only consideration —it is just the medium through which an extension of federal control and federal domination and federal dictation is sought to be extended.

This attempt to control oil production is just another raid upon the powers of the sovereign states. If oil is taken over by the Washington bureaucrats, other industries would be in line thereafter for federal control.

The issue is up to all industries to help check this constant centralization of all power in Washington.

Illinois Oil Industry Can Be Prosperous in 1940

By JOHN PUGH, President, Independent Oil Producers Association of Illinois

ILLINOIS should resolve not to permit the mistakes of 1939 to be repeated in its oil operations for 1940.

The year 1939 has been a hectic one in Illinois oil history. We have seen daily production increase from a little more than 100,000 barrels the first of the year to in excess of 340,000 barrels in October, with possible total production for the year of 90 million barrels. All this is most gratifying and I know I express the sentiment of every independent in Illinois when I say that we would be most happy to have Illinois oil production double in 1940, provided we can avoid the physical and economic losses of 1939. We have seen physical waste increase as production mounted, until the loss of gas in one field alone is estimated by the state planning engineer to be more than $10,000 per day. Drastic price fluctuations have marked the year. Millions of barrels of Illinois oil—one-fifth the crop—has been forced to sell to cut-price purchasers. Despite these discouraging conditions, we independents have carried on a steady campaign for fair and reasonable conservation, and, as we review the situation, we have every reason to feel a high degree of hope for improvement in our industry in 1940.

During the past few weeks a remarkable swing in both public and industry sentiment favoring conservation legislation has taken place in Illinois. Favorable editorial comment from newspapers over the state, support from chambers of commerce and civic clubs, from state leaders and outstanding farmers and business men has been increasing steadily. In addition to these most hopeful signs we now have the support of representatives of more than 80 percent of the oil being produced in Illinois. So, I believe, I can safely say that the prospects for more orderly production methods and early stabilization of the industry in Illinois are stronger than at any time since oil development began in the "basin." Such a program would mean elimination of most of the present physical and economic waste and the establishment of the industry on a firm basis of continuing prosperity in 1940, and years to follow. The measure of this improvement will be determined by the support the people give to impending oil conservation legislation through their state officials.

Two committees are appointed by I.P.A.

Appointment of two standing committees of the Independent Petroleum Association of America has been made by Frank Buttram, Oklahoma City, president of the association.

The committee on Balance of Supply with Demand, which prepares quarterly surveys of the industrys economic position and recommendations for future conduct, is again headed by Harold B. Fell, executive vice president of the association, and the following members:

Vice chairman, J. S. Bridwell, president of Bridwell Oil Company, Wichita Falls, Texas; Van S. Welch, president of Flynn, Welch and Yates, Inc., Artesia, New Mexico; J. A. Aylward, president of Aylward Production Company, Wichita, Kansas; and Hugh M. Stalcup, vice president of Skelly Oil Company, Tulsa, Oklahoma. Minor S. Jameson, Jr. statistician and economist of the association, Washington, D. C., is secretary of the committee. Stalcup is the new member of this group.

This committee has been in existence for several years and its reports are given wide circulation. It suggests in each report a level of production that will result in a minimum of waste.

A committee on Refining and Marketing Practices was authorized by the membership in 1939. Buttram has reappointed the members for 1940. Charles F. Roeser, president of Roeser and Pendleton, Inc., Fort Worth, Texas, is chairman, and the other members are B. L. Majewski of Deep Rock Oil Corporation, Chicago, Illinois; Paul G. Blazer, president of Ashland Oil and Refining Company, Ashland, Kentucky; John M. Lovejoy, president of Seaboard Oil Company of Delaware, New York City; and Walter A. Jones, vice president of Plymouth Oil Company, Pittsburgh, Pennsylvania.

This committee has as its immediate purpose the elimination of any practices in the marketing division of the industry which affect injuriously the producing division.

Limitations in Producing Wells With High Water-Oil Ratios

By FRANK B. TAYLOR, Staff Writer

OF the many problems facing the producing branch of the industry, there is one that continually grows more and more important. It is the question of what to do with the well capable of making substantial oil volume provided an excessive volume of water also is lifted.

Taking St. Louis area of central Oklahoma as an example, some of the wells there are capable of making 100 barrels of crude, but only when the operator can also lift 2000 or 3000 barrels of water. Such volumes of water are forcing abandonment of many wells because it is impossible to realize a profit from the sale of crude after lifting costs have been deducted.

Abandonment Justified

In a way, the abandonment of a well that can make 50 or more barrels of crude per day appears to be in contradiction to the efforts of producing companies toward conservation. A little thought, however, and it is seen that no crude is being wasted. It simply is not being produced at this time. In the future, as a result of improved methods, it may be that this crude can be successfully handled, at which time it would constitute a major, known reserve. In addition, it remains a fact that the best place to store crude is in its natural reservoir.

How Ratio Works

In some areas, as in St. Louis district, it is vital that the greatest possible fluid volume be lifted. The more water produced, the greater the ratio of crude, and, conversely, the less water produced, the lower will be the oil ratio. This changing ratio has been established in many wells. It is shown where adjacent wells produce from the same formation. Where this is the case, and all wells are producing large water volumes, the complete shutdown of one producer has been known to decrease the oil/water ratio in the others.

In western Kansas, although it is required that excessive water volumes be produced along with the oil, the factors established at St. Louis do not apply. Instead of showing an increase in crude, some wells have gone almost entirely to water under forced production. This is the usual case and applies to certain northern Louisiana, Arkansas and Permian Basin fields as well as to western Kansas.

Some Produced at Loss

Some high water volume wells are actually being produced at a loss, while there are many on which the operator is merely "trading dollars." But every well that falls into either of the latter two categories is an actual detriment to the operating company. This is not so much because the individual well is no longer a sound economic unit, but rather because it constitutes a drag upon the entire producing department.

The cost of production as applied against the value of crude per barrel tells the story of profit or loss. Disregarding the per barrel value, there is only demand for a given volume of crude, admitting that the demand itself is somewhat flexible. Any portion of this demand that is supplied from unprofitable producers depresses the margin of profit to be realized from every barrel of crude produced from wells that do not have excessive operating costs.

An examination of some specific examples of high water volume wells, and the cost of producing them, leads to some interesting conclusions and points to angles from which the problem may most successfully be attacked.

Kansas Experience

In western Kansas, two leases producing from lime formation carrying large water volumes, each located in different fields, show the following analysis. Each well is equipped with two-inch tubing pumps.

	Lease No. 1 (6 wells, 6 months)	Lease No. 2 (6 wells 5 months)
Labor	$1,350.00	$1,354.00
Transportation	245.50	201.90
Fuel, etc.	88.00	111.40
Reconditioning	38.00	.00
Repairs	231.00	510.40
Miscellaneous	63.50	24.00
Taxes (Total)	440.00	410.55
	$2,456.00	$2,612.25

Lease No. 1 made a net oil recovery of approximately 830 barrels per month, but only with lifting an average of 500 barrels of water per day. Adding housing, disposal and other fixed lease charges, the lease only cleared $65.00 per month. Lease No. 2 went into the red $208.06 during the five months. It produced less crude and about one-third more water.

Well Loses; Lease Pays

In New Mexico, a high fluid level well pumped with 3¾-inch casing pump made a net of 1500 barrels crude per month for two months. Being operated as part of a larger lease unit, it allowed the operator to proportion his charges to each well,

Hydraulic lifting set-up capable of handling 3000 barrels of fluid daily on W. Clark lease in St. Louis district.

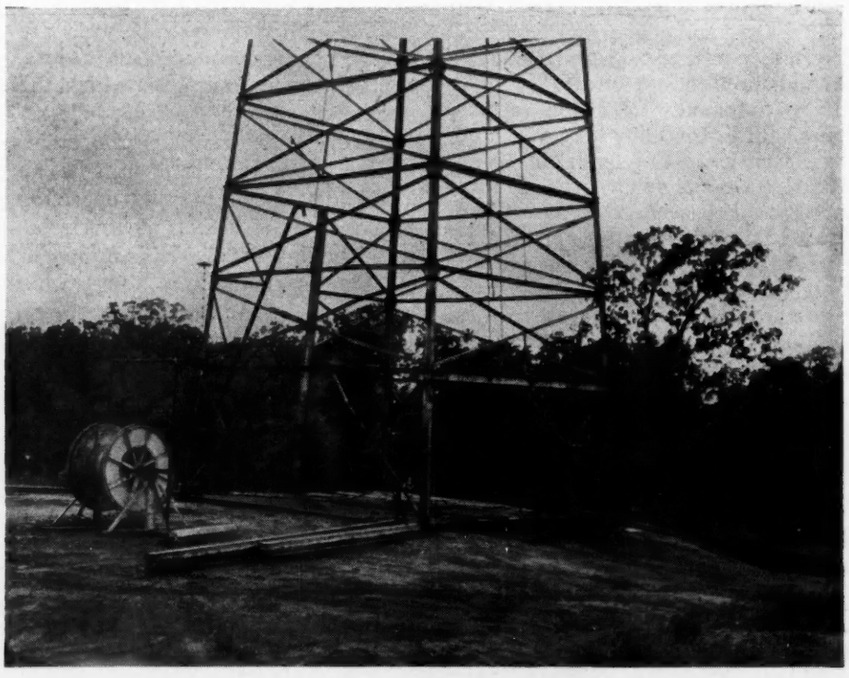
and a profit of $377 was realized. However, if the well is considered individually, the operation lost about $400 during the same period. Only the spreading of necessary costs by allocation allows the operation of this particular well. Separately, the unit is uneconomic.

In Oklahoma's St. Louis district, one lease averaged 975 barrels of oil per month, net, the water volumes averaged 600 to 700 barrels per day and the operator sustained a loss of $466.74 in five months of operation. Another lease, one of the exceptionally high-water volume units common to the area lifted 2400 barrels of water per day with an oil net of around 900 barrels per month. During the five months this well returned a profit of $701. For the volume of fluid it was necessary to lift in this case, the profit was exceptional.

There are three angles of approaching an economic solution. The first of these is naturally the possibility of reducing the cost of operation. However, there are limitations here, for it is certain that labor charges cannot be substantially reduced, nor can taxes be lowered, nor can a reduction in other operating charges be effected to much advantage. A second means of approach is by way of increasing fluid volumes with a parallel decrease in the high maintenance costs that generally accompany increased fluid production. This trend is now under way, being exemplified in shock modifying equipment, cushioning devices, better balancing, and improved lifting equipment. The last angle of major consequence is in improving lifting means, or by radical change in lifting mechanics.

Along this line of approach, the submerged, centrifugal pumps, hydraulic-actuated lifts, pneumatic lifting units and rotary pumps have given the operators added leeway in many areas. High-volume units are effective in reducing the per barrel lifting costs, and in a number of cases have kept wells on production and showing some profit where they would otherwise necessarily have been abandoned. For every increase in daily crude recovery, by whatever means, the profits tend to increase in a somewhat higher relationship because other charges such as labor, transportation, taxes, etc., remain constant on the per day basis.

Every method that is applicable to field operating practice adds to reserves as truly as the discovery of a new field, for it allows crude that could not otherwise be economically produced to be lifted with at least a small profit. On the other hand, the reduction of costs of producing by as much as 10 percent is estimated to amount to an additional 4000-6000 barrels of recoverable oil per well in areas similar to St. Louis. A proportional increase in the price structure of crude would account for a proportionate increase in recoverable reserves. However, this would not be limited to high-water volume wells but would apply equally to producers approaching depletion in a normal manner.



Electrically operated submerged centrifugal pumping units handle 3000 barrels of fluid handily. Well is producing 2400 barrels water with 70 barrels crude per day at profit.

HIGHLIGHTS IN THE WEEK'S NEWS

Legislation

Cole bill biggest item among 50 oil bills before Congress

More than 50 measures directly applicable to the oil industry are awaiting consideration during the session of Congress which convenes this week—the last session of the present administration provided it does not become necessary to call a special meeting between its adjournment and the end of the year.

Only a few of the large number of pending bills, however, are expected to be taken up for action during the session; most of them, like the great majority of all measures introduced, will never get even to the stage of committee consideration.

All of these bills were introduced at the last regular session, but aside from the extension of the Connally Act and the Interstate Oil Compact only a half dozen were taken up in committee and it is this small group which has the best chance of consideration this year.

Offshore Ownership

Most important of the measures on which action may be expected are the Nye and Hobbs bills for assertion of the government's title to the California off-shore oil fields, on which Senate and House committees held hearings last session; the Harrington bill for divorce of marketing from other branches of the industry, also the subject of hearings before a House committee, and the Dempsey bill authorizing states owning lands acquired from the federal government to include them in conservation agreements, passed by the House and reported favorably by a Senate committee.

While the plan to have the federal government acquire the California underwater oil deposits has been vigorously pressed by its authors, Senator Gerald P. Nye (Rep., N.D.) and Representative Sam Hobbs (Dem., Ala.), there is considerable doubt as to its future, in view of the fact that a House Judiciary subcommittee, after hearings, made an adverse report. Such reports are generally confirmed by the full committee, although in exceptional cases they may be over-ridden.

Federal Control

Of major importance among such oil measures as may be introduced during the coming session will be the revised Cole bill for federal control of production. The measure originally was introduced last session at the request of President Roosevelt, but Representative William P. Cole, Jr., (Dem., Md.), chairman of a House Interstate Commerce subcommittee in charge of the measure, has made known his disapproval of many provisions of the bill, which was written in the Interior Department, and his intention of writing a revision.

During the month it is possible that Cole will call his committee for further hearings on the subject, at which will be called the representatives of the oil states who were precluded from testifying at New Orleans last month by the sudden death of Representative Mapes, who brought hearings to an abrupt halt. Also due to be heard before any report is made on the legislation are representatives of the industry itself, who have not yet been given an opportunity to testify, the only other hearings so far held having been those at which officials of the interested federal agencies appeared.

Others Pending

Also resting in committee files, but unlikely to receive consideration, are measures calling for the divorce of pipe lines from other branches of the industry, for the nationalization of oil and for the introduction of alcohol-gasoline blends.

Possible of introduction is legislation dealing with revision of the anti-trust laws, based on the 4½ weeks of hearings conducted during the summer by the Temporary National Economic Committee, on which a report may be filed within the next few weeks.

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Allowables

January allowables exceed indicated market demand

Allowables set by the prorated states for January production are, in the aggregate, 0.4 percent higher than the Bureau of Mines estimate of demand for domestic crude. The regulated states failed to keep pace with the bureau in curtailing mid-winter allocations—the bureau foreseeing demand for 44,300 barrels daily less than in December, while conservation reductions amounted to only 22,245 barrels. Prospects for only moderate overproduction of the economic allotment through the month faded as the Illinois figure was cut while indications point to progressive production gains in that state from the first of the year onward.

Most States Over

Arkansas allowable was cut 800 barrels from the December quota to 71,200 barrels, but is 19.3 percent in excess of federal forecast. The California self-imposed allocation remained the same as in December, 599,000 barrels, while bureau prognosis was dropped to 593,900 barrels.

Louisiana allowables were raised 12,992 barrels to 268,192 barrels; a point 13,922 barrels over the government prediction. Michigan, which is expected to produce between 65,000 and 71,000 barrels daily, will exceed the advisable limit by as much as 10,000 barrels. Oklahoma allocation by both federal and state agencies was the same at 433,900 barrels, a decrease of 3700 barrels from December.

Texas Curtails Most

Texas wells, slated for shutin 13 days during January, will be allowed an average of 1,376,000 barrels daily. This quota is 39,843 barrels less than that fixed at the first of December, while bureau prediction was cut only 27,000 barrels to place the state allowable 35,000 barrels below that set by the bureau.

Thus, Texas is the only major producing area that has fixed its January quota beneath the Bureau of Mines estimate of state demand. However, the commission has juggled some field allowables already, and is expected to increase others before the month passes. The state's total will still be below the bureau figure, despite increased outputs granted and new completions.

The chief offender is Illinois, which does not have any state regulation. While the Bureau of Mines estimate of demand allocated but 314,800 barrels to the state, it has been producing 340,000 barrels daily in recent weeks.

The excessive crude oil production indicated by allowables for January forecasts additions to crude oil stocks, and dampens hopes that rising gasoline stocks would not exceed their present

January Allowables Exceed Indicated Market Demand

STATE	Bureau of Mines Forecast of Demand	State Allowable Beginning of Month	Excess or Deficiency of State Allowable	Percent Excess or Deficiency
Arkansas	59,700	71,200	+ 11,500	+ 19.3
California	593,900	599,000*	+ 5,100	+ 0.9
Kansas	160,600	168,000‡	+ 7,400	+ 4.1
Louisiana	254,200	268,192	+ 13,992	+ 5.5
Michigan	61,000	71,000	+ 10,000	+ 16.4
New Mexico	101,900	101,900	.....	.....
Oklahoma	433,900	433,900	.....	.....
Texas	1,411,000	1,376,000†	— 35,000	— 2.4
Total eight states	3,076,200	3,087,192	+ 12,992	+ 0.4
Other states	493,500	.....	.....	.....
Total United States	3,569,700	.....	.....	.....

* Recommendation of Central Committee of California Oil Producers.
‡ December allowable extended until further notice.
† Daily average, considering 13 shutdown days, and various exemptions.

all-time peak. These trends make it appear likely that the forepart of 1940 will witness market difficulties, particularly with gasoline prices.

An accompanying table presents a comparison of allowables of the various leading producing states with the Bureau of Mines estimate of consumer demand.

Texas permits total 262

The Texas Railroad Commission last week approved permits for drilling 262 new wells in Texas, seven less than were permitted the week before.

Operators in the East Texas field were granted permits to drill 17 more wells, including 10 in Gregg, 5 in Rusk, and 2 in Upshur County. Nine locations were listed from the remaining section of the East Central Texas area.

For the third successive week, the North Texas District held first place in the state with 61 permits, including 18 in Archer, 13 in Wichita, and 10 in Cooke County. Panhandle operators reported 21 new locations.

The commission approved applications for the drilling of 53 new wells in West Texas, with 14 in Ector and 14 in Yoakum County, while 12 permits were granted in the West Central Texas District.

Permits were approved for 52 more wells in Southwest Texas, and operators in the Gulf Coast reported 37 locations, including 10 in Harris County.

California asks two firms to defer drilling

Opposition to the drilling of two new deep tests, one at Buena Vista and another in the Strand pool, Kern County, has been expressed by the new well committee which is taking steps to reduce the number of drilling operations slated for California in 1940.

Telegrams to Honolulu Oil Company and Tide Water Associated Oil Company were sent by Lawrence Vander Leck, chairman of the Central Committee of California Oil Producers, and J. R. Pemberton, oil umpire, backing up the resolution opposing the drilling of both projects and asked that the work be deferred.

The new well drilling committee said it was fundamentally opposed to the deeper exploitation of the Buena Vista and Strand pools. The Buena Vista field has been a steady producer from a 4500-foot horizon and Strand was discovered a short time ago by Tide Water Associated and is also thought to overlay deeper productive horizons like other San Joaquin Valley fields.

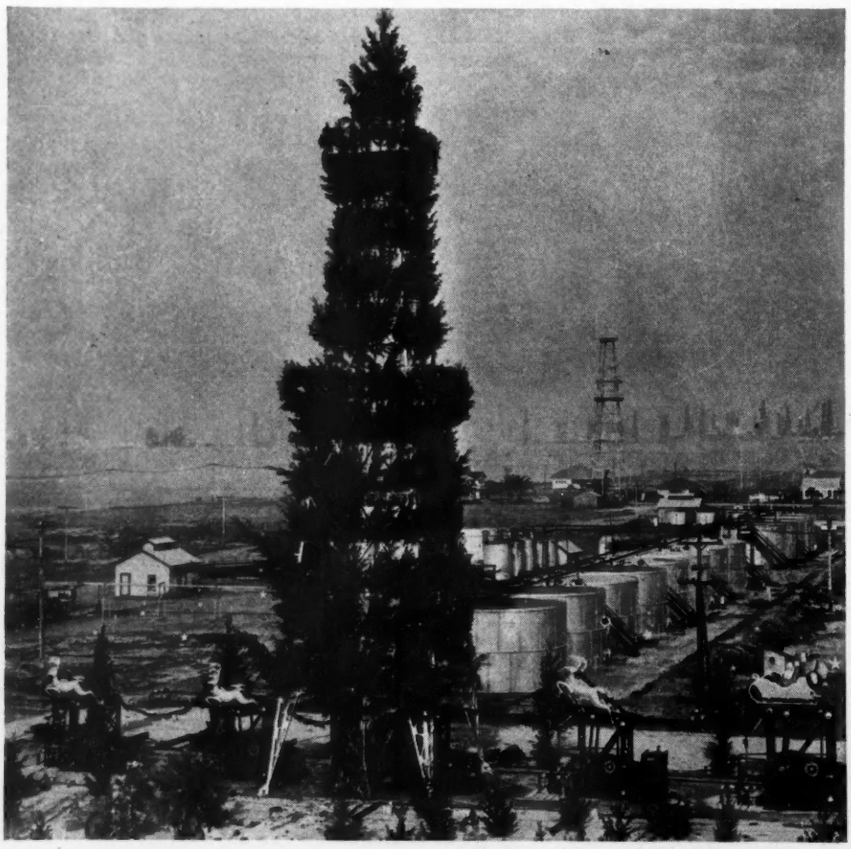
Vander Leck and Pemberton expressed the hope that the two oil companies would cooperate to hold off drilling for deeper zones stressing that it has been because of this type of work that has kept the petroleum industry in an unsettled state for months.

A week ago the drilling committee decided to hold a series of meetings and to study the effect of new drilling and to learn how many new wells are scheduled for 1940. It also will attempt to get companies to lessen their number of tests.

Faced with decreasing market, oil operators in the state are now pretty well convinced that something must be done about new drilling at once. With exception of one of the seven major producing and purchasing companies, all have had to take a reduced allotment throughout 1939. In comparison to the allotment they enjoyed in the previous year their cut averaged from 3000 to 8000 barrels daily each. In October 1938, the majors had an allotment of 328,000 barrels daily and in October this year their allotment was 316,000 barrels.

Beginning New Years, the state will go under a new production schedule for top wells. At the last regular meeting of the central committee the allotment for top wells was set at 195 barrels daily for January, as against 204 for December. The state quota remains at 599,000 barrels daily.

CHRISTMAS COMES TO OIL TOWN



—International News Photo.

Huntington Beach, California, a town rich from its wealth of oil, utilized oil pumps and a derrick to rig up its Christmas decoration. The trunk of the "tree" is an oil derrick, while on four pumps are mounted Santa Claus and his reindeers. The motion of the pumps made the reindeers appear to be moving in long, graceful bounds.

Courts

Hot oil truckers fail to pay assessed fines

What is to be done about approximately 95 truckers of hot oil from East Texas into Louisiana sentenced at Tyler (Texas) on misdemeanor cases back in 1935, and who have since then failed to pay the fines assessed them in Federal court, is a problem facing government officials in the eastern district of Texas at present.

These men convicted for misdemeanor violations of the Connally act which in section 5 (b) says a person shall not transport untendered oil from one state to another were in nearly every case given a suspended sentence of several months or more, suspended on condition of payment of a fine. Usually the stipulation was that the sentence was to remain suspended on condition that the fine be paid in 30 or 60 days. Fines averaged $150.

The fact that the truckers had almost en masse failed to pay their fines was discovered in Tyler about 18 months ago when a government agent was checking all old cases to make sure the government was getting all the fines owed it. Nothing apparently has been done about the matter since then but recently the question has been revived with pressure being brought to bear on the district attorney's office at Beaumont to get these fines collected. The matter is of special importance now as it is being considered by government officials in Washington in connection with the recent Ickes-Wilson controversy, throwing light on Connally act enforcement in Texas.

There seems to be no one in court officialdom in the eastern district of Texas aware of the cause as to why the truckers have shown disregard for the court sentences.

It is notable that of the 95, three have paid part of their fines, court records show. One man was paying $1 a month but he has long since quit his payments. Four others in addition to the 95 have paid as much as $50 or $75 and in these cases their fines have been reduced by court order to that total, so these four cases have thus been disposed of.

In 11 other cases there were dismissals. In one there was no fine assessed and in another, the defendant was freed, without penalty.

It is significant that two of the four defendants who have satisfied the government's claim of fines against them had foreign names.

These cases present some sort of a mystery in Connally act enforcement in East Texas as no officials of the court contacted here seem to know how or why the defendants have not been required to make restitution to the government before this.

It is believed certain, however, that by the next term of court in Tyler, which is in February, that an order will be drafted, forcing government agents to seek out these defendants, bring them into court and requiring them to either pay their fines at once or go to jail and serve their sentences. Should the judge decide that the honor of the government in this matter is at stake he may force the truckers who otherwise would have escaped by paying a mere fine to serve their suspended jail sentences of several months. Of course it will be a difficult matter for any deputy marshal to find the men to serve a capias on any one of them now.

In many cases these truckers were poor men who made as many trips as possible in a week to take oil bought cheaply in East Texas to refineries in Louisiana for cracking.

Imports

Lower U. S. tariff lets in million barrels first week

Imports of foreign crude oil and fuel oil under the Venezuelan trade agreement during the period from December 16 to 21 totaled over 1,000,000 barrels, it was reported December 26 by the Customs Bureau.

Bureau statistics showed that receipts included 30,885,039 gallons from Venezuela out of a quota of 146,588,007 gallons; 9,187,552 gallons from the Netherlands and its possessions out of a quota of 41,387,156 gallons; none from Columbia, which has a quota of 8,155,105 gallons; and 6,504,414 gallons from "other countries," for which a quota of 7,747,350 gallons was set.

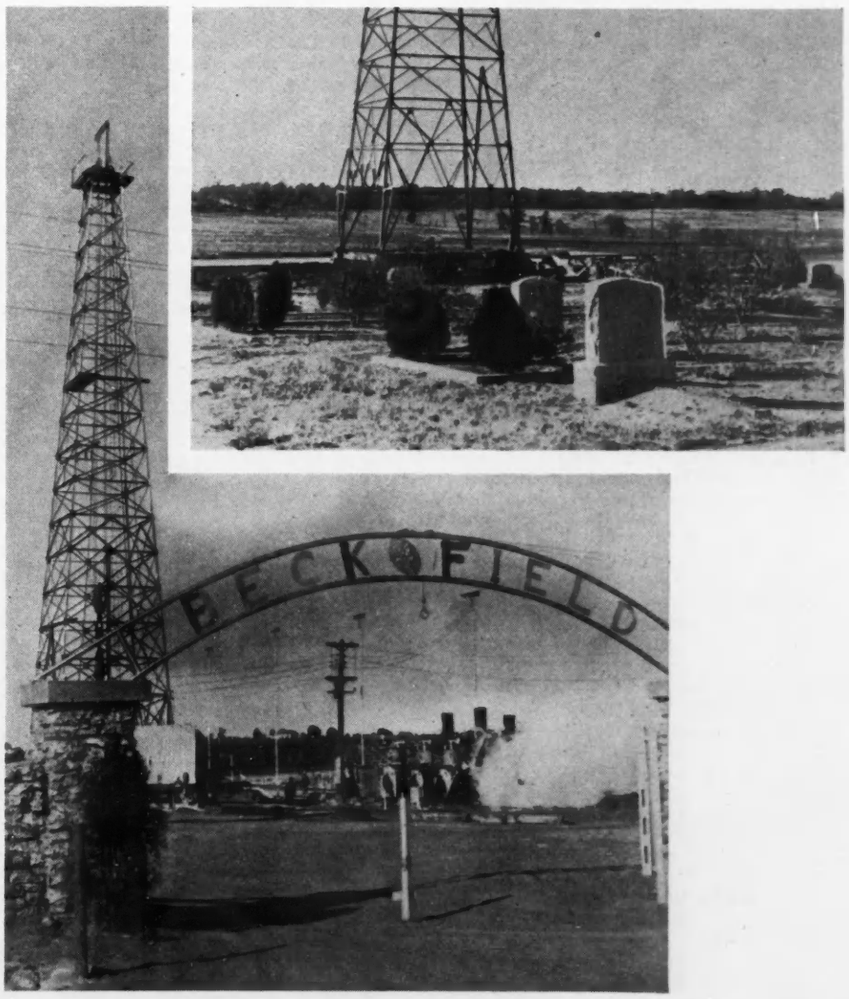
U. S. oil import quota policy termed inconsistent

Charges of inconsistency in the imposition of quotas on oil imports in the face of previous opposition to the adoption of any quota system were leveled at Secretary of State Cordell Hull recently by Russell B. Brown, general counsel of the Independent Petroleum Association of America.

Admitting that the adoption of quotas

[*Continued on page 60*]

NOCONA HAS OIL WELLS EVERYWHERE



Nocona, in Montague County, known as the "Leather Goods Center," is rapidly becoming the oil center of North Texas. Wells are "all over town," including one on the high school gridiron and one in the cemetery. In a recent game the kicker booted the football into the slush pit. Chugging machinery at this location drowns out the pep squad yells.

MEN IN THE INDUSTRY'S NEWS

CARL E. REISTLE, JR., BECOMES CHIEF PETROLEUM ENGINEER OF HUMBLE OIL & REFINING COMPANY

»

M. BOWMAN THOMAS PROMOTED AND MOVED TO HOUSTON

»

C. E. REISTLE, JR.

EFFECTIVE January 1, Carl E. Reistle, Jr., advanced from the position of assistant chief petroleum engineer to chief petroleum engineer of Humble Oil & Refining Company. He succeeds Walter W. Scott, who died December 7.

At the same time it was announced that M. Bowman Thomas had been appointed engineer in charge of the petroleum engineering department. Thomas, a graduate of the University of Oklahoma, has been division engineer for the company in Corpus Christi, and will move to Houston to assume his new duties.

After graduating from the University of Oklahoma in 1922, Reistle joined the petroleum division staff of the Bureau of Mines. In 1924, he was transferred to Laramie, Wyoming. He took charge of the vertical flow work of the bureau in 1929, and returned to Bartlesville, Oklahoma. He prepared reports on many fields during the next four years.

In 1933, Reistle left the bureau to become field chairman for the East Texas Engineering Association at Kilgore, Texas. He resigned in 1936 to become assistant chief petroleum engineer for Humble Oil & Refining Company.

R. W. HANNA, director and vice president of Standard Oil Company of California, resigned his position effective January 1, and his place has been filled through the election to the board of J. L. Hanna, until now the general manager of the manufacturing department. The resignation of R. W. Hanna was due to ill health. He joined the company in 1909 starting his career at the El Segundo refinery. He became a member of the board of directors in 1924 and was elected vice president in January, 1931.

DON HARLAN, field superintendent of Antilles Petroleum Company, La Brea, Trinidad, B.W.I., and E. P. Hayes, division petroleum engineer of The Texas Company at Houston, were honored with a luncheon December 29 by the Houston chapter of Nomads.

IVY GILBERT, Trinidad Petroleum Development Company, San Fernando, Trinidad, was a recent visitor in Houston.

R. OGARRIO, vice president of The Texas Company, New York, recently visited his mother in Mexico City.

CAPT. J. F. LUCEY, president of Lucey Petroleum Company, Dallas, has been named Texas state chairman for the Finnish Relief Fund by Ex-President Herbert Hoover, who organized the drive for funds. The following oil men have been appointed vice chairmen by Capt. Lucey: Chas. F. Roeser, Fort Worth; Orville Bullington, Wichita Falls; and Gus F. Taylor, Tyler.

W. T. (BILL) KNIGHT, president of Consolidated Oil Company, one of the largest producers in the K-M-A deep area, made practical use of the Holiday spirit by outfitting 670 needy school children at Wichita Falls with clothing at a cost of $4500. A large staff of assistants worked 3 days in fitting and distributing the garments. The Texan played a similar role last Christmas.

HOWARD BOYD, landman for Magnolia Petroleum Company with headquarters at Evansville, Indiana, spent the holidays at Dallas, where he worked as chief scout for the company a number of years.

O. A. MILLIKEN, formerly superintendent of Panhandle Eastern Pipe Line Company's compressor station at Houstonia, Missouri, is now superintendent of the station at Louisburg, Kansas.

ROBERT E. BRIGHAM, Cities Service Oil Company, has been promoted to head the land and lease department at the Kansas offices, succeeding Gordon Watson, deceased.

HENRY L. DOHERTY, MASTER OF MEN AND MILLIONS, VICTIM OF BRONCHIAL PNEUMONIA IN PHILADELPHIA

»

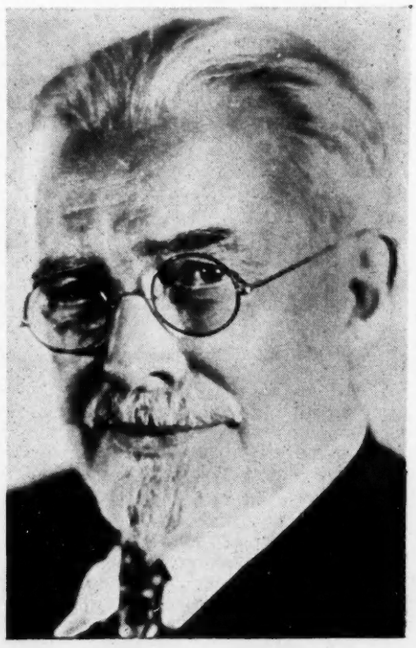
CITIES SERVICE HEAD HONORED FOR ACCOMPLISHMENTS BY INSTITUTIONS OF LEARNING

»

HENRY L. DOHERTY, prominent oil executive, father of the idea of unit operation, recipient of the highest honor that can be bestowed by the American Institute of Mining and Metallurgical Engineers (the Anthony F. Lucas medal), and acknowledged as the man who recognized the importance of solubility of natural gas in crude oil, died of bronchial pneumonia in a Philadelphia hospital December 26. His death created vacancies at the helms of several corporations, most notable of which were Cities Service Companies and Henry L. Doherty & Company.

Born in Ohio in 1870, Doherty's business career began as a newsboy in Columbus when he was 10 years of age. At 12 he became office boy of the local gas company and educated himself by studying catalogs and handbooks. By the time he was 20 he had pretty well mastered the problems of Columbus Gas Company, and spent the next 15 years as engineer and manager of public utility companies in Madison, St. Paul, San Antonio, Denver and other cities. In 1905, at the age of 35, he organized Henry L. Doherty & Company, bankers and operators of public utility companies. Five years later he organized Cities Service Company,

[*Continued on Page 51*]



HENRY L. DOHERTY

Market situation marred by weakness of gasoline

Some further weakening of gasoline was the principal development of significance last week in the market situation. The excessive stocks of that product are primarily responsible for the decline of prices which set in several weeks ago.

During the past week, several refiners in the Middle West reduced their quotations on all grades of gasoline ⅛ cent a gallon.

Gasoline stocks now are more than 10 percent above the level of a year ago and are considered at least 10,000,000 barrels larger than necessary, with little chance for cutting down of the surplus. On the contrary, there is danger that the surplus may grow, particularly if this winter proves severe or even normal, in contrast with the past two relatively mild winters. Severe weather would cut down gasoline consumption and at the same time force large production of that product as a necessity in making enough fuel oil to meet heavy market requirements.

Other Projects Strong

In pleasant contrast, the markets for fuel oils, kerosene, and lubricants continue remarkably strong. The past week brought some additional advances in the prices of those products.

Socony-Vacuum Oil Company on December 28 advanced its prices for Bunker C fuel oil 35 cents to $1.50 a barrel at New York, Philadelphia, Boston, and Providence and to $1.60 at Portland. Other companies previously had announced similar advances. The higher prices have been forced largely by sharp increases in shipping rates from the Gulf Coast to the Atlantic seaboard.

On the East Coast last week several suppliers advanced their quotations for kerosene and heating oils as well as heavy fuel oils.

Lubricants Strong

Adding to the strength of the lubricating oil market last week was the report by the Bureau of Foreign and Domestic Commerce that United States exports of lubricants in November were more than double those in that month of 1938.

The lube exports totaled 1,466,000 barrels, valued at $10,015,000, in November, compared with those of 694,000 barrels, valued at $5,706,000 in November of 1938. Purchases by the belligerents were responsible for the sharply increased lubricant exports.

In the Mid-Continent there is an extreme scarcity of bright stocks, with buyers actively seeking supplies, although unable to fulfill their requirements. However, no material changes have been made in prices.

In the Western Pennsylvania refining district, also, the supplies of bright stock are scarce, with numerous plants sold up through January. Within the past week, some refiners have further advanced their prices.

The markets for crude oil remain generally firm, although the weakness of gasoline prices has adverse implications. Gasoline remains the industry's principal product, and serious depression of gasoline prices naturally would tend to pull down the prices of the raw material from which the gasoline is made.

PRODUCT PRICES

	Range Last Week (Cents a gal.)		Late Week Changes from Week Before	
REFINED GASOLINE				
Oklahoma Refineries:				
62 Octane and Under	4⅞	4⅝	...	...
63-66 Octane	4⅜	4¾	...	...
67-69 Octane	4⅝	5⅛	...	...
70-72 Octane	4⅞	5⅜	...	...
Mid-Western Tank Car:				
62 Octane and Under	4⅞	4⅝	...	...
63-66 Octane	4⅜	4½	...	...
67-69 Octane	4⅝	5⅛	...	...
70-72 Octane	4⅞	5⅜	...	...
NATURAL GASOLINE				
Grade 26-70:				
F. O. B. Group 3	2¾	...	—¼	...
F. O. B. Breckenridge, Texas	2¼	2½	—½	—¼
KEROSENE				
Oklahoma Refineries:				
41-43 water white	3⅝	4¼	...	...
42-44 water white	3¾	4⅝	...	...
Mid-Western Tank Car:				
41-43 water white	3⅝	4¼	...	...
42-44 water white	3¾	4⅝	...	...
FUEL OILS				
Mid-Western Tank Car:				
Range Oil	3½	3⅞	...	...
Gas and Fuel Oils:				
No. 1 Prime White	3½	3¾	...	...
No. 1 Straw	3¼	3⅜	...	...
No. 2 Straw	3⅛	3¼	...	...
No. 3 Straw	3	3⅛	...	...
No. 5 (per bbl.)	65	70	...	...
No. 6 (per bbl.)	45	55	...	...

Gasoline inventory large; fuel oil supplies low

Statistics of the industry for the week ended December 23 reflected no material change in the unsatisfactory gasoline situation and a continuation of large withdrawals from the comparatively light stocks of fuel oils.

Crude oil production remained around the high levels of earlier weeks and was 250,000 barrels in excess of the Bureau of Mines estimate of average daily market demand for December.

Crude runs to stills were reduced slightly but remained well above last year's corresponding level; and curtailment of gasoline production was small, with the result that there was a further addition of over one half million barrels to storage.

Production and Runs

United States crude oil production averaged 3,867,900 barrels daily in the week ended December 23, according to the American Petroleum Institute. That

Trends of United States Production and Stocks

Figures are from American Petroleum Institute weekly reports, except those on crude stocks, which are from Bureau of Mines weekly reports

	Crude Oil Production (Barrels Daily)	Crude Runs to Stills (Barrels Daily)	Crude Oil Stocks (Barrels)	Gasoline Stocks (Barrels)	FUEL OIL STOCKS	
					Gas Oil & Dist. Fuels	Residual Fuel Oil
1937:						
August 28	[5]3,731,450	3,425,000	309,506,000	66,997,000	112,111,000	
September 25	3,666,300	[4]3,455,000	307,974,000	65,620,000	116,472,000	
1938:						
March 19	3,433,550	3,080,000	306,380,000	[1]93,192,000	122,067,000	
November 12	3,243,250	3,180,000	273,394,000	[6]67,551,000	34,175,000	120,491,000
November 26	3,260,900	3,295,000	270,563,000	68,628,000	33,749,000	119,885,000
December 10	3,245,100	3,150,000	[6]269,509,000	68,687,000	32,068,000	118,711,000
December 31	3,201,450	3,115,000	273,024,000	71,695,000	29,082,000	115,741,000
1939:						
January 28	3,248,250	3,235,000	271,763,000	77,279,000	26,583,000	112,766,000
February 25	3,328,850	3,185,000	271,758,000	84,597,000	23,419,000	110,252,000
March 25	3,382,350	3,225,000	273,915,000	87,561,000	21,487,000	107,551,000
April 22	3,526,700	3,280,000	277,156,000	[2]87,769,000	21,085,000	105,035,000
April 29	3,568,200	3,405,000	278,440,000	86,794,000	[7]25,844,000	[7]108,409,000
May 6	3,580,900	3,275,000	[2]278,607,000	86,216,000	26,167,000	108,597,000
May 27	3,585,250	3,405,000	278,289,000	84,152,000	26,992,000	109,386,000
June 24	3,452,800	3,430,000	272,297,000	81,733,000	30,239,000	111,726,000
July 29	3,539,100	3,460,000	268,513,000	77,887,000	34,900,000	114,053,000
August 5	[1]3,909,400	3,445,000	268,982,000	76,431,000	35,601,000	114,512,000
August 26	[10]1,690,800	3,475,000	246,982,000	73,475,000	37,722,000	116,237,000
September 30	3,658,200	3,560,000	233,023,000	71,168,000	38,081,000	115,466,000
October 7	3,435,850	3,505,000	231,564,000	[6]71,152,000	38,549,000	114,397,000
October 21	3,771,550	[1]3,650,000	[3]229,127,000	72,122,000	39,358,000	115,060,000
October 28	3,498,500	3,520,000	230,453,000	72,660,000	39,562,000	114,786,000
November 25	3,818,100	3,510,000	231,811,000	75,595,000	38,527,000	112,106,000
December 2	3,289,200	3,480,000	234,161,000	76,365,000	37,955,000	110,383,000
December 9	3,827,350	3,460,000	232,016,000	77,196,000	37,087,000	109,291,000
December 16	3,865,750	3,415,000	232,615,000	78,158,000	36,285,000	107,977,000
December 23, 1939	3,867,900	3,395,000	.....	78,707,000	35,068,000	107,061,000
December 23, 1938	3,449,700	3,160,000	[4]269,931,000	71,057,000	[8]	[9]
Change in past year	+12.1%	+7.4%	—13.8%	+10.8%	—4.9%	—11.2%

[1] All time peak. [2] Peak for 1939. [3] Lowest since April, 1922. [4] Stocks December 17, 1938.
[5] Peak prior to 1939. [6] Lowest for year.
[7] Prior to April 29, 1939, data did not include stocks at terminals, in transit, etc., except in California.
[8] Available data for year ago include only stocks at refineries, and not at terminals, in transit, etc., except in California. Those stocks on December 23, 1938, totaled 29,091,000 barrels and comparable stocks on December, 23, 1939, totaled 27,670,000 barrels, or 4.8% less.
[9] Available data for year ago include only stocks at refineries, and not at terminals in transit, etc., except in California. Those stocks on December 23, 1938, totaled 115,409,000 barrels, and comparable stocks on December 23, 1939, totaled 102,439,000 barrels, or 11.2% less.
[10] Lowest since October, 1922, due to the shutdown of six Mid-Continent states.

CRUDE OIL PRICE SCHEDULES

MID-CONTINENT GRAVITY SCALE PRICES—Posted October 11-13, 1938

(Some fields of Mid-Continent have flat price postings, and are shown separately)

Gravity	[7]Okla.-Kans.	[10] North La.-Ark.	[9] Schuler, Ark. 9-13-39	North & W. Central Tex.	East Central Tex.	Gray Co. Tex.	Carson, Hutchinson Co. Tex.	[1]Tomball Tex. Type	West Tex.-New Mex.	[2]Gulf Coast (Tex.-La.) 10-2-39	[3]Some La. Gulf Areas 10-2-39	Jennings, La.	[4]Anahuac, Tex. Type 10-2-39	[5]Refugio, Tex. Type 10-2-39	[6]Mirando, Tex. Type 10-2-39	[8]Salt Creek, Wyo.
17–17.9	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
18–18.9	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
19–19.9	.....	.....	.....	.....	.....	.....	.....	.....	*$0.53	*$0.86	*$0.86	.....	*$0.81	*$0.91	*$0.86	.....
20–20.9	$0.60	.....	.....	.....	.....	.....	.....	.....	.55	.88	.88	.....	.83	.93	.88	.....
21–21.9	.63	.....	.....	.....	.....	.....	.....	.....	.57	.90	.90	.....	.85	.95	.90	.....
22–22.9	.66	.....	.....	.....	.....	.....	.....	*$0.95	.59	.92	.92	.....	.87	.97	.92	.....
23–23.9	.69	.....	.....	.....	*$0.78	.....	.....	.97	.61	.94	.94	.....	.89	.99	.94	.....
24–24.9	.72	*$0.73	*$0.63	*$0.71	.80	.....	.....	.99	.63	.96	.96	.....	.91	1.01	.96	.....
25–25.9	.75	.75	.65	.73	.82	.....	.....	1.01	.65	.98	.98	.....	.93	1.03	.98	.....
26–26.9	.78	.77	.67	.75	.84	.....	.....	1.03	.67	1.00	1.00	.....	.95	1.05	1.00	.....
27–27.9	.81	.79	.69	.77	.86	.....	.....	1.05	.69	1.02	1.02	.....	.97	1.07	1.02	.....
28–28.9	.84	.81	.71	.79	.88	*$0.72	*$0.67	1.07	.71	1.04	1.04	.....	.99	1.09	1.04	*$0.86
29–29.9	.87	.83	.73	.81	.90	.74	.69	1.09	.73	1.06	1.06	.....	1.01	1.11	1.06	.88
30–30.9	.90	.85	.75	.83	.92	.76	.71	1.11	.75	1.08	1.08	.....	1.03	1.13	1.08	.90
31–31.9	.92	.87	.77	.85	.94	.78	.73	1.13	.77	1.10	1.10	*$0.87	1.05	1.15	1.10	.92
32–32.9	.94	.89	.79	.87	.96	.80	.75	1.15	.79	1.12	1.12	.89	1.07	1.17	1.12	.94
33–33.9	.96	.91	.81	.89	.98	.82	.77	1.17	.81	1.14	1.14	.91	1.09	1.19	1.14	.96
34–34.9	.98	.93	.83	.91	1.00	.84	.79	1.19	.83	1.16	†1.16	.93	1.11	1.21	1.16	.98
35–35.9	1.00	.95	.85	.93	1.02	.86	.81	1.21	.85	1.18	.....	.95	1.13	1.23	1.18	1.00
36–36.9	1.02	.97	.87	.95	1.04	.88	.83	1.23	.87	1.20	.....	.97	1.15	1.25	1.20	1.02
37–37.9	1.04	.99	.89	.97	1.06	.90	.85	1.25	.89	1.22	.....	.99	1.17	1.27	1.22	1.04
38–38.9	1.06	1.01	.91	.99	1.08	.92	.87	1.27	.91	1.24	.....	1.01	1.19	1.29	1.24	1.06
39–39.9	1.08	1.03	.93	1.01	1.10	.94	.89	1.29	.93	1.26	.....	1.03	1.21	1.31	1.26	1.08
40+	1.10	1.05	.95	1.03	1.12	.96	.91	1.31	.95	1.28	.....	1.05	1.23	1.33	1.28	1.10

* Minimum price and applies also to purchases of lower gravity.

† Maximum price and applies also to purchases of higher gravity.

[1] Tomball, Raccoon Bend (Deep) and Satsuma.

[2] Includes Amelia, Barbers Hill, Big Creek, Blue Ridge, Clear Lake, Cotton Lake, Esperson, Fannett, Goose Creek, Hankamer, Lovells Lake, Lochridge, Moore, Mykawa, Nome, Orange, South Liberty, Spindle Top, Sugar Land, Thompsons, Webster, and West Beaumont.

[3] Includes Berwick Bay, Bay St. Elaine, Caillou Island, Chacahoula, Dog Lake, Edgerly, Four Isle, Gillis, Grand Bay, Hackberry, Horseshoe Bayou, Iberia, Jefferson Island, Lake Barre, Lake Pelto, Leesville, Port Barre, Starks, Timballier Bay, Quarantine Bay, and Vinton fields.

[4] Anahuac, Dickinson, Gillock, Cedar Point, Fairbanks, Turtle Bay, Hull, Orange, Pierce Junction, Batson, Caplen, Humble, North Dayton, Saratoga, Sour Lake, South Esperson, Spindle Top, West Orange, Thompson (deep), and Raccoon Bend (shallow) fields.

[5] Includes Saxet, E. White Point, Greta, O'Connor-McFadden, Taft, Plymouth and Tom O'Connor fields.

[6] Includes Duval, Jim Hogg, Webb and Zapata counties, Texas, and Heyser and Placedo fields.

[7] Oklahoma Pipe Line and Magnolia schedules.

[8] Includes La Barge, Midway Dome, Dutton.

[9] Also Buckner, Village, Magnolia.

[10] Add 10 cents for Bunkie and Eola field prices.

Mid-Continent Flat Prices

	Flat Price	Date Posted
Arkansas:		
Smackover	$0.73	10–12–38
Louisiana:		
Garden Island	1.24	10–12–38
Gibson	1.04	10–11–38
Lafitte	1.04	10–12–38
Texas:		
Cayuga	.78	10– 2–39
East Texas	1.10	10–12–38
Talco	.65	10– 2–39
Livingston, Cleveland	1.10	10–12–38
Van	.93	10–12–38
Pettus	1.29	10–12–38
Pecos County	.78	10–12–38
Pecos Shallow	.65	10–12–38
Luling	.87	10–12–38
Lytton Springs	.99	10–12–38
Salt Flat, Darst Creek, Hilbig, Carroll, Clark and Zoboroski	.96	10–11–38
Flour Bluff-Jim Wells Co.	1.23	10–11–38
Guerra	1.06½	5– 8–39
Seabreeze, Willow Slough, La Belle, Hardin, S. China	1.10	9–14–39
Clay Creek	.85	10–13–38
Conroe	1.27	10–11–38
Long Lake	1.08	10–19–38

Middle West Prices

Lima, Ohio	$0.90	10–13–38
Illinois	.95	6– 8–39
Illinois Basin	1.05	6– 8–39
Lake Centralia-Salem, Illinois	1.05	10–21–39
Princeton, Indiana	.95	6– 8–39
Griffin, Sw., Ind.-Se. Ill., Sand	.95	10–10–39
Griffin: McClosky Lime	.85	10–10–39
Western Kentucky	1.00	6– 8–39
Birk City, Western Kentucky	.90	6– 8–39
Kentucky River, Eastern Ky.	1.10	6– 9–39
Big Sandy River, Eastern Ky.	1.02	6– 9–39

Michigan Prices

	Flat Price	Date Posted
Central (Basin):		
Porter, Greendale, Crystal, Wise, Midland	$1.02	10– 9–39
Buckeye, Edenville, Bentley, Beaverton	1.00	10– 9–39
Freeman, Sherman, Clare	.97	10– 9–39
Arenac, Ogemaw, W. Branch	.87	11– 9–39
Southwest (Shallow):		
Allegan, Kent Counties	1.03	10– 9–39
Van Buren Co., Bloomingdale	1.03	11– 9–39
Zeeland	.85	10– 9–39
Bangor	.83	10– 9–39

Rocky Mountain States Prices

Colorado:		
Canon City, Ft. Collins, Wellington, Moffat and Florence	.90	10–11–38
Iles, Light	.98	10–11–38
Iles, Heavy	.92	10–11–38
Montana:		
Cat Creek—Cut Bank	1.10	10–11–38
Sunburst	.90	11–16–37
Dry Creek	.92	10–11–38
New Mexico:		
Artesia	.77	10–11–38
Hogback	1.00	10–11–38
Wyoming:		
Big Muddy	.98	10–11–38
Byron	.55	10–11–38
Elk Basin	.90	10–11–38
Frannie, Light	.55	10–11–38
Frannie, Heavy	.42	10–11–38
Garland	.50	10–11–38
Grass Creek, Light	.90	10–11–38
Grass Creek, Heavy	.40	10–11–38
Hamilton Dome	.35	10–11–38
Lance Creek	.77	10–11–38
Mill Creek	.72	10–11–38
Oregon Basin	.50	10–11–38
Osage	1.30	10–11–38
Poison Spider	.59	10–11–38
Rock Creek	1.00	10–11–38
Tensleep	.646	10–11–38

Pennsylvania Prices

	Flat Price	Date Posted
Bradford Allegheny	$2.50	12– 1–39
National Transit Lines	2.50	12– 1–39
Sw. Pa. Pipe Line	2.15	12– 1–39
Eureka Pipe Line	2.09	12– 1–39
Buckeye Pipe Line	2.05	12– 1–39
Corning Grade, Ohio	1.12	11– 4–39

Major Price Changes

	Penna. (Nat. Tr.)	Mid-Cont. (36 Gr.)	Calif. (26 Gr.)
June 19, 1933	Up 10	Up 19	.....
June 26, 1933	Up 10	.....	Up 9-12
July 6, 1933	Up 13	Up 10	.....
July 17, 1933	Up 15	.....	.....
July 28, 1933	Up 15	.....	.....
Aug. 11, 1933	Up 10	.....	.....
Aug. 24, 1933	.....	Up 10	.....
Aug. 30, 1933	Up 15	.....	.....
Sept. 6, 1933	Up 10	Up 10	Up 15
Sept. 8, 1933	.....	Up 15	.....
May 1, 1934	Up 10	.....	.....
Nov. 6, 1934	Cut 25	.....	.....
Dec. 6, 1934	Cut 25	.....	.....
Jan. 4, 1935	Up 15	.....	.....
Feb. 4, 1935	Up 15	.....	.....
May 16, 1935	Cut 15	.....	.....
June 26, 1935	Cut 15	.....	.....
July 16, 1935	Cut 10	.....	.....
Aug. 29, 1935	.....	.....	Cut *1
Sept. 6, 1935	Up 5	.....	.....
Oct. 29, 1935	Up 15	.....	.....
Nov. 1, 1935	.....	.....	Up *28
Nov. 18, 1935	Up 15	.....	.....
Dec. 6, 1935	.....	.....	Up *9
Jan. 9, 1936	.....	Up 10	.....
Jan. 13, 1936	Up 15	.....	.....
Feb. 26, 1936	.....	.....	Up †5
Dec. 28, 1936	Up 12	.....	.....
Jan. 28, 1937	.....	Up 12	.....
Feb. 24, 1937	Up 10	.....	.....
June 7, 1937	Up 15	.....	.....
Sept. 1, 1937	Cut 22	.....	.....
Oct. 12, 1937	Cut 25	.....	.....
Dec. 1, 1937	Cut 15	.....	.....
March 7, 1938	Cut 17	.....	.....
June 13, 1938	Cut 25	.....	.....
Sept. 1, 1938	Cut 12	.....	.....
Oct. 11, 1938	.....	Cut 20	.....
Jan. 21, 1939	Up 12	.....	.....
Feb. 2, 1939	Up 8	.....	.....
March 6, 1939	Up 12	.....	.....
Oct. 6, 1939	Up 25	.....	.....
Nov. 1, 1939	Up 15	.....	.....
Dec. 1, 1939	Up 10	.....	.....

* Signal Hill 26 gravity.

† Seal Beach 26 gravity.

Crude Production Taxes

Oklahoma—Five percent of gross value less royalty interests.

Texas—2¾ cents or 2¾ percent, whichever is higher.

Louisiana—From four to 11 cents a barrel, depending upon gravity.

Arkansas—2.6 percent of gross market value.

Montana—Two percent of gross value at well and ⅓ of 1c per barrel.

New Mexico—Severance tax of 2 percent on oil and gas.

Wyoming and New Mexico—Production tax based upon state and county assessments.

California—.66443 mills per barrel of oil produced and 17.39 cents an acre on proved lands.

was 2150 barrels a day more than in the previous week and 12.1 percent more than the output of 3,449,700 barrels in the week ended December 23 a year ago.

Crude runs to stills were brought down from 3,415,000 to 3,395,000 barrels daily, but the latter rate was 7.4 percent above that of 3,160,000 barrels a day in the corresponding week a year ago.

Gasoline Sitation

In consequence of smaller runs to stills, gasoline production was brought down from 11,583,000 barrels in the preceding 7 days to 11,494,000 barrels in the week ended December 23, a cut of about 13,000 barrels in the average daily output.

Stocks of finished and unfinished gasoline in the United States were augmented 549,000 barrels, having risen to 78,707,000 barrels, at which level they were 10.8 percent higher than one year before. At the beginning of the week they had been only 10.7 percent above the year-ago trend.

At this time a year ago the gasoline inventory was seriously excessive, and now it is even farther above economic limits, as demand is up only around 5 or 6 percent, in contrast with the gain of 10.7 percent in stocks.

Heating Oil

The week of December 23 brought a further large withdrawal from heating oil stocks, as heavy seasonal consumption proceeded. The American Petroleum Institute reported that stocks of gas oil and distillate fuel came down 1,217,000 barrels, to 35,068,000, at which level they were 4.9 percent lower than a year before. At the beginning of the week the inventory had been only 3.4 percent under the year-before level.

The heating oil inventory appears especially small when it is considered that consumption has been running about 14 percent higher than a year ago.

Industrial Oil

Stocks of the heavy, industrial fuel oils also were drawn upon heavily, having been reduced 916,000 barrels, to the 107,061,000-barrel level. The inventory then was 11.2 percent smaller than a year before.

The supplies of heavy oil also are small in relation to prevailing demand, which has been about 10 percent better than a year ago.

Crude Oil Stocks

Stocks of crude oil in the United States were increased 600,000 barrels in the week ended December 16, the Bureau of Mines reported. They rose to 232,615,000 barrels, and at that level were 13.8 percent under the mark of a year previously.

Right to deduct depletion upheld

Election by a taxpayer, under the provisions of Article 23 (M) (16) of Regulations 96 issued under the Revenue Act of 1934, to deduct expenditures for wages, fuel, repairs, supplies, etc., incident to and necessary for the drilling of wells and preparation of wells for the production of oil or gas, rather than to capitalize them, does not involve the forfeiture by the taxpayer of his right to a deduction for percentage depletion under the provisions of Section 114 (B) (3) of the act, it was held by the Board of Tax Appeals.

The board's decision was rendered in an appeal by Sultana Oil Corporation, Shreveport, La., from deficiencies of $8897 assessed by the commissioner of internal revenue for 1934.

It was also ruled, in passing on this case, that for the purpose of limitation on percentage depletion to 50 percent of net income from oil property, such net income must be reduced by development expenditures deducting in computing the taxable net income.

Doherty Dies

[*Continued from Page 48*]

holding company for nearly 200 public utility and petroleum companies, stocks of which at one time aggregated more than a billion dollars on market quotations and activities of which took in 33 states and several foreign countries. At the age of 40 he was rated as a multimillionaire.

Doherty was honored many times by institutions of learning for promotion of scientific and inventive enterprises. Among honorary degrees conferred upon him were: doctor of laws from Lincoln Memorial University in 1929, doctor of science from the same institution in 1931, doctor of engineering from Lehigh University in 1931, doctor of letters from Temple University in Philadelphia in 1937, and doctor of science from the

CALIFORNIA CRUDE OIL PRICES

(Posted February 26, 1936; except El Segundo and Wilmington, posted October 15, 1937; Greeley and Canal posted July, 1938 and Montebello, posted August 11, 1939). All gravity above those quoted take highest prices of that field.

Gravity	Alamitos Heights	El Segundo and Signal Hill	Seal Beach	Huntington Beach	Inglewood	Playa Del Rey	Olinda Brea Canyon	Athens Rosecrans	Torrance	Richfield	Whittier East Coyote La Habra	Montebello	West Coyote Hills	Santa Fe Springs	Newhall McKittrick Kern River Round Mt. Kern Front	Greeley Canal	Mountain View	Midway-Sunset Lakeview Buena Vista Hills Elk Hills	Lost Hills	Coalinga	Wheeler Ridge	Wilmington
14-14.9	$0.74	$0.80	$0.79	$0.78	$0.79	$0.80	$0.76	.....	$0.80	$0.76	$0.76	$0.77	$0.78	.....	$0.70	....	....	$0.70	$0.70	$0.70	....	$0.75
15-15.9	.74	.80	.79	.78	.79	.80	.76	.....	.80	.76	.76	.77	.78	.....	.70	....	....	.70	.70	.70	....	.75
16-16.9	.74	.80	.79	.78	.79	.80	.76	.....	.80	.76	.76	.77	.78	.....	.70	....	....	.70	.70	.70	....	.75
17-17.9	.74	.80	.79	.78	.81	.80	.76	.....	.80	.76	.76	.77	.78	.....	.70	....	....	.70	.70	.70	....	.77
18-18.9	.74	.80	.79	.78	.84	.80	.78	.....	.82	.76	.76	.77	.78	.....	.70	....	....	.70	.70	.70	....	.79
19-19.9	.74	.82	.79	.82	.87	.84	.81	.....	.85	.76	.78	.77	.78	.....	.70	....	$0.70	.74	.74	.71	$0.70	.82
20-20.9	.74	.85	.79	.85	.90	.88	.84	.....	.88	.78	.82	.77	.80	.....		....	.70	.78	.78	.72	.70	.85
21-21.9	.74	.88	.79	.89	.93	.93	.88	.....	.91	.80	.85	.77	.84	$0.78	Domingues	....	.73	.82	.82	.74	.70	.88
22-22.9	.74	.92	.82	.92	.96	.98	.92	.....	.93	.84	.89	.79	.88	.78		....	.77	.87	.86	.78	.72	.92
23-23.9	.77	.95	.86	.96	.99	1.02	.96	$0.84	.96	.88	.93	.82	.92	.78	.79	....	.80	.92	.90	.82	.76	.95
24-24.9	.80	.99	.91	1.00	1.02	1.06	.99	.88	.99	.91	.96	.85	.96	.82	.81	....	.84	.97	.94	.86	.79	.99
25-25.9	.82	1.03	.95	1.03	1.05	1.11	1.03	.93	1.02	.95	*Coles	.89	.99	.86	.83	....	.88	1.01	.98	.90	.83	1.03
26-26.9	.85	1.06	1.00	1.07	1.09	1.16	1.06	.98	1.05	.98	Levee	.93	1.03	.90	.86	....	.91	1.06	1.02		....	1.06
27-27.9	.88	1.10	1.05	1.11	1.12	.....	1.10	1.03	....	1.02	1.00	.97	1.06	.95	.88	$0.91	.95	1.10	1.06	El-	....	1.10
28-28.9	.90	1.14	1.10	1.14	1.15	.....	1.14	1.07	....	1.06	1.03	1.01	1.10	.99	.90	.94	.99	1.15	1.10	wood	....	1.14
29-29.9	.93	1.17	1.15	1.18	1.18	F.O.B.	1.17	1.12	Kettle-	1.09	1.06	1.06	1.14	1.03	.93	.98	1.02	1.20	1.14	Ter-	....	1.17
30-30.9	.95	1.21	1.19	1.22	1.21	Pipe	1.21	1.17	man	....	1.09	1.10	1.17	1.08	.95	1.02	1.06	1.25	1.18	race	....	1.21
31-31.9	....	.....	.....	.....	1.24	Line	1.24	1.22	Hills	....	1.13	1.14	1.21	1.12	.97	1.05	1.09	1.29	....	F.O.B.	....	.....
32-32.9	....	.....	.....	.....	1.27	.....	1.27	1.27	.....	....	1.16	1.18	1.25	1.16	1.00	1.09	1.13	1.34	....	Ship	....	.....
33-33.9	....	.....	.....	.....	....	.....	.....	1.32	1.19	....	1.19	1.22	1.28	1.20	1.28	1.13	1.17	1.38	....	1.28	....	.....
34-34.9	....	.....	.....	.....	....	.....	.....	1.37	1.23	....	1.22	1.26	1.32	1.25	1.32	1.17	1.20	....	....	1.32	....	.....
35-35.9	....	.....	.....	.....	....	.....	.....	1.42	1.27	....	1.26	1.30	....	1.29	1.35	1.20	....	....	....	1.35	....	.....
36-36.9	....	.....	.....	.....	....	.....	.....	1.46	1.31	....	1.29	1.34	....	1.33	1.39	1.24	....	....	....	1.39	....	.....
37-37.9	....	.....	.....	.....	....	.....	.....	1.51	1.35	....	1.32	1.38	....	1.37	1.43	1.28	....	....	....	1.43	....	.....
38-38.9	....	.....	.....	.....	....	.....	.....	1.56	1.39	....	1.35	1.42	....	1.42	....	1.31	....	....	....	....	....	.....
39-39.9	....	.....	.....	.....	....	.....	.....	1.61	1.43	....	1.39	1.47	....	.....	....	1.35	....	....	....	....	....	.....
40-40.9	....	.....	.....	.....	....	.....	.....	1.66	....	....	1.42	1.51	....	.....	....	1.39	....	....	....	....	....	.....
41-41.9	....	.....	.....	.....	....	.....	.....	.....	....	....	1.45	1.55	....	.....	....	1.43	....	....	....	....	....	.....
42-42.9	....	.....	.....	.....	....	.....	.....	.....	....	....	1.48	1.59	....	.....	....	1.46	....	....	....	....	....	.....
43-43.9	....	.....	.....	.....	....	.....	.....	.....	....	....	1.51	1.63	....	.....	....	1.50	....	....	....	....	....	.....
44-44.9	....	.....	.....	.....	....	.....	.....	.....	....	....	1.55	1.67	....	.....	....	1.54	....	....	....	....	....	.....
45-45.9	....	.....	.....	.....	....	.....	.....	.....	....	....	1.58	1.71	....	.....	....	1.57	....	....	....	....	....	.....
46-46.9	....	.....	.....	.....	....	.....	.....	.....	....	....	1.61	1.75	....	.....	....	1.61	....	....	....	....	....	.....
47-47.9	....	.....	.....	.....	....	.....	.....	.....	....	....	.....	.....	....	.....	....	1.65	....	....	....	....	....	.....
48-48.9	....	.....	.....	.....	....	.....	.....	.....	....	....	.....	.....	....	.....	....	1.68	....	....	....	....	....	.....

* Also Richfield Western.

University of Miami in 1938. The Lucas medal, bestowed upon him in 1938, was one of several he received from various engineering societies. In 1898 he won the first Beall gold medal of the American Gas Light Association for a paper titled "Gas for Fuel."

Several inventions patented by Doherty included a cooler system for preparing and condensing gas, a bench fuel economizer for use in the manufacture of coal gas, improved methods for distillation of petroleum and recovery of by-products, appliances for washing and drying glass and brass, remote control devices for lamps in display signs, and a new type of lime kiln.

JAMES M. JOHNSON, engineer, Shell Oil Company, has been transferred from Hoisington, Kansas, to Tonkawa, Oklahoma.

JESSE JAMES, Magnolia Petroleum Company, has been made assistant to W. C. Thomas, district superintendent, at Lake Charles, Louisiana.

J. B. NORTHCOTT, 52, of Muskegon, veteran producer and contractor in Michigan, died December 22 at his home after a brief illness.

GEORGE L. PEYTON, 55, East Texas producer, died December 26 of a heart attack while undergoing treatment in a hospital at Mexia, where he had resided since 1898. He had been active in the oil business with his brother, William M. Peyton, for more than a decade.

Bureau issues final 1938 statistical report

Crude petroleum production in the United States in 1938 failed to equal that of the preceding year, the total output of 1,214,355,000 barrels being five percent under the 1937 total of 1,279,160,000 barrels, it was reported November 1 by the Bureau of Mines.

Production in the first part of 1938 was higher than in the corresponding period of 1937, but after that the trend was downward compared with a rise in 1937, the bureau said in a summary of the year.

Crude petroleum comprised 92 percent of the new supply of all oils in 1938, it was stated, the remaining eight percent consisting of natural gasoline, benzol and imports. With increasing yields and the rapid growth of recycling, it was commented, the output of natural gasoline rose to 51,347,000 barrels, or four percent above 1937. On the other hand, the marked decline in activity at steel mills was reflected in the output of benzol, which decreased from 2,790,000 to 1,764,000 barrels, the lowest for any year since 1934. Imports remained at between 4,000,000 and 5,000,000 barrels monthly for most of the year, the annual totals for both crude oil and refined products being somewhat under 1937.

"Most of the states produced less crude oil in 1938 than in 1937 but several reported notable gains," the bureau commented. "Illinois production in 1938 was 24,075,000 barrels, or more than three times what it was in 1937. Arkansas continued to stage a recovery; it showed a gain of about 55 percent in 1938 over 1937. California's output again rose despite efforts to reduce the daily average to 600,000 barrels or less. The large declines were in Oklahoma and Texas. Every major district of these two states declined in output in 1938, except coastal Texas, which increased slightly."

Prices Drop

Analysis of prices showed that most crude-oil postings east of California were reduced from 10 to 20 cents per barrel in October with the result that the national average fell from $1.18 in 1937 to $1.13 in 1938. California, however, had a higher average in 1938 than in 1937, and in that respect was alone among the states. The decline of five cents in the national average, the bureau pointed out, was more than had been indicated by posted prices, and is believed to have been related to an increase in the practice of selling under posted prices in Illinois and other states.

Less Drilling

Reduced demand and lower prices reduced drilling, with the result that the number of oil wells brought in, 19,121, was 14 percent under 1937; while abandonments increased nearly 50 percent, so that the number of producing wells was increased only 6610 to a total of 369,640 on December 31, 1938. Aver-

United States Crude Oil Production

Estimates Compiled by THE OIL WEEKLY

DISTRICT OR STATE	Bureau of Mines Estimate of Daily Demand (Dec.)	State Allowable in Dec.	BARRELS DAILY FOR WEEK ENDED Dec. 30	Dec. 23
TEXAS—				
Texas Panhandle	.....	.....	73,000	80,050
North Texas	.....	.....	79,500	97,500
West Central Texas	.....	.....	26,600	33,250
West Texas	.....	.....	226,000	270,300
East Central Texas	.....	.....	72,300	98,100
East Texas Field	.....	.....	419,000	495,000
South Texas	.....	.....	210,500	240,500
Texas Gulf Coast	.....	.....	218,500	260,150
Total Texas	1,438,100	1,402,673*	1,325,400	1,574,850
CALIFORNIA—				
Long Beach	.....	.....	43,200	44,500
Midway-Sunset	.....	.....	50,200	55,100
Kettleman Hills	.....	.....	52,900	52,300
Wilmington	.....	.....	84,600	87,200
Others	.....	.....	370,300	380,800
Total California	594,500	599,000†	601,200	619,900
OKLAHOMA—				
Oklahoma City	.....	.....	92,000	109,150
Seminole Area	.....	.....	108,170	109,450
Others	.....	.....	224,125	217,075
Total Oklahoma	437,600	437,600	425,495	435,675
ILLINOIS—				
Salem	.....	.....	183,250	185,250
Louden	.....	.....	75,050	74,750
Other New Pools	.....	.....	71,950	72,250
Old Pools	.....	.....	8,000	7,950
Total Illinois	315,200	.....	338,250	340,200

DISTRICT OR STATE	Bureau of Mines Estimate of Daily Demand (Dec.)	State Allowable in Dec.	BARRELS DAILY FOR WEEK ENDED Dec. 30	Dec. 23
LOUISIANA—				
North Louisiana	.....	.....	69,750	70,050
South Louisiana	.....	.....	200,250	205,600
Total Louisiana	255,200	255,200	270,000	275,650
KANSAS	168,000	168,000	178,600	183,750
NEW MEXICO	110,000	110,000	109,850	112,100
EASTERN STATES—				
Pennsylvania Grade	.....	.....	80,100	77,250
Others, Eastern	.....	.....	26,200	26,050
Total Eastern States	104,600	.....	106,300	103,300
MOUNTAIN STATES—				
Wyoming	60,000	.....	64,600	64,600
Montana	15,200	.....	17,700	17,600
Colorado	4,200	.....	3,900	3,700
Total Mountain States	79,400	.....	86,200	85,900
MICHIGAN	61,000	65,000	68,750	66,900
ARKANSAS	56,100	72,000	71,300	69,150
MISSISSIPPI	.....	.....	2,200	2,250
NEBRASKA	.....	.....	25	.....
‡Total 8 Prorated States	3,120,500	3,116,437	3,050,595	3,337,975
Total United States	3,619,700	.....	3,583,570	3,869,625

*Daily average allowable at December 1, considering 12 shutdown days and various exemptions.
† Recommendation of Central Committee of California Oil Producers Association.
‡ Texas, California, Oklahoma, Louisiana, Kansas, New Mexico, Michigan, Arkansas.

age daily production per well, which had increased materially in 1937, dropped 0.7 barrel to 9.1 barrels, it was said.

Discussing the refinery situation, the bureau found that crude runs to stills in 1938 totaled 1,165,016,000 barrels, or between one and two percent below the record figure of 1,183,440,000 barrels of 1937, but most of the decline in gasoline output due to decreased runs was offset by a gain in yield from 43.9 to 44.3 percent. Other important changes in yields were gains of 0.6 percent in gas oil and distillate fuel oil and 0.1 percent in asphalt, and a decline of 1.1 percent in the residual yield.

Demand High

"At the end of the third quarter of 1938 it appeared that the domestic demand for motor fuel for the year would not come up to 1937, but the business recovery and generally fair weather of the last quarter reversed the situation so that the total for the year (523,003,000 barrels) was nearly 4,000,000 barrels above 1937," the report stated. "On the other hand, there was little doubt that because of war demands exports of motor fuel would increase and it developed that the year's total of 50,109,000 barrels was about 30 percent higher than in 1937, although below the figures of 1928-30. In contrast to 1937, when stocks of gasoline increased sharply, a reduction of about 4,000,000 barrels in finished inventories was made in 1938. This brought the total to just under 66,000,000 barrels (excluding nearly 6,000,000 barrels of unfinished gasoline) at the close of the year.

"The mild winter and a decline in industrial activity were reflected in the domestic demand for the light fuel oils (including kerosene), which barely surpassed the totals of 1937. On the other hand, the demand for residuals was down sharply because of the recession in business."

Details of supply and demand for the year, as compared to 1937, are shown in the accompanying table.

PIPE LINE NEWS

Revamping gathering lines in Walnut Bend area

Wichita Falls.—Sinclair Refining Company is revamping its gathering system in the Walnut Bend pool, Cooke County, North Texas, so as to utilize gravity in gathering oil from the 5 producing leases. The company is laying 3 miles of 4-inch and ½ mile of 6-inch line that will deliver oil to its booster station near the center of west line of the S. H. Putman tract, T. W. Ward Survey. The station will have a capacity of 6000 barrels daily.

Sinclair building line to take oil from Long Lake

Tyler.—Sinclair Refining Company awarded contract to Monarch Construction Company for laying a 10-mile 6-inch lateral from its East Texas field —Mexia 12-inch trunk line to the Long Lake field, Anderson County. The new unit is scheduled to be completed by January 15, and will be the only outlet, as Gulf Refining Company is withdrawing in order to utilize its nearby trunk line for the handling of sour oil from New Mexico and West Texas exclusively.

Field booster station will be erected by Sinclair Refining Company near the northeast corner of Hunt Oil Company's C. L. Smith lease, John Adams Survey, near west edge of production. About 30 miles of gathering lines operated by the producers and also Gulf Refining Company will be purchased, and 4 miles of additional line will be built so as to gather oil by gravity. The field is currently producing an average of 2250 barrels of 41-gravity oil daily from 122 wells.

To build gas line from Poza Rica to Mexico City

Mexico's department of national economy announces that a pipe line will be constructed during the first six months of 1940 to convey natural gas from Poza Rica field to Mexico City.

Supply and Demand of all Oils in 1938, by Months

(Including wax, coke, and asphalt in thousands of barrels)

	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	1938	1937
New Supply:														
Domestic production:														
Crude petroleum	106,152	94,733	106,679	102,975	98,829	94,472	102,914	106,363	98,516	101,793	98,482	102,447	1,214,355	1,279,160
Natural gasoline	4,422	3,975	4,412	4,257	4,282	4,087	4,212	4,311	4,167	4,461	4,330	4,431	51,347	49,177
Benzol	152	138	148	133	121	109	118	138	150	176	188	193	1,764	2,790
Total production	110,726	98,846	111,239	107,365	103,232	98,668	107,244	110,812	102,833	106,430	103,000	107,071	1,267,466	1,331,127
Imports:														
Crude petroleum	2,095	1,883	2,569	1,827	2,081	2,192	2,565	1,714	1,574	2,693	2,359	2,860	26,412	27,484
Refined products	2,083	1,990	2,287	2,328	1,915	2,529	2,180	2,940	2,663	2,223	2,255	2,503	27,896	29,673
Total new supply, all oils	114,904	102,719	116,095	111,520	107,228	103,389	111,989	115,466	107,070	111,346	107,614	112,434	1,321,774	1,388,284
Daily average	3,707	3,669	3,745	3,717	3,459	3,446	3,613	3,725	3,569	3,592	3,587	3,627	3,621	3,804
Decrease in stocks, all oils	*11,245	*7,251	*5,616	*3,844	1,726	7,023	*449	4,746	3,320	5,915	6,957	7,795	9,077	*45,768
Demand:														
Total demand	103,659	95,468	110,479	107,676	108,954	110,412	111,540	120,212	110,390	117,261	114,571	120,229	1,330,851	1,342,516
Daily average	3,344	3,410	3,564	3,589	3,515	3,680	3,598	3,878	3,680	3,783	3,819	3,878	3,646	3,678
Exports:														
Crude petroleum	5,953	5,321	6,121	7,549	7,791	7,424	7,250	7,003	5,577	6,780	5,602	4,883	77,254	67,234
Refined products	7,986	8,609	9,201	10,431	10,688	10,338	9,951	10,700	9,487	9,388	8,458	11,237	116,474	105,600
Domestic demand:														
Motor fuel	35,323	31,981	41,409	43,430	44,937	48,383	47,650	50,549	46,150	46,365	45,084	41,742	523,003	519,352
Kerosene	5,361	5,017	5,150	4,333	3,637	3,257	3,760	4,292	4,187	5,185	5,368	6,813	56,360	54,972
Gas oil & distillate fuels	12,642	11,651	10,487	7,800	7,280	5,591	7,926	7,966	8,655	10,206	11,551	15,694	117,449	116,841
Residual fuel oils	25,749	23,912	25,599	22,161	22,256	22,147	20,470	23,596	23,041	25,624	27,532	29,746	291,833	325,514
Lubricants	1,471	1,305	2,195	1,587	1,723	1,605	1,844	2,002	2,127	1,805	1,738	1,831	21,233	23,323
Wax	115	82	91	101	92	86	75	81	68	72	71	61	995	1,062
Coke	535	416	308	313	422	573	445	473	636	442	520	506	5,589	5,765
Asphalt	1,006	872	1,456	1,636	2,131	2,636	2,786	3,189	2,983	2,620	1,683	1,157	24,155	21,876
Road oil	252	199	124	229	658	1,248	1,440	1,536	1,097	695	221	148	7,847	7,954
Still gas	5,227	4,718	5,191	5,363	5,832	5,677	6,020	6,043	5,577	5,646	5,373	5,223	65,890	64,218
Miscellaneous	137	132	137	166	143	157	177	158	131	149	144	145	1,776	2,249
Losses	1,902	1,253	3,010	2,577	1,364	1,290	1,746	2,624	674	2,284	1,226	1,043	20,993	26,556
Total domestic demand	89,720	81,538	95,157	89,696	90,475	92,650	94,339	102,509	95,326	101,093	100,511	104,109	1,137,123	1,169,682
Daily average	2,894	2,912	3,070	2,990	2,919	3,088	3,043	3,307	3,178	3,261	3,350	3,358	3,115	3,205
Stocks:														
Crude petroleum:														
Refinable in U. S.	306,937	307,076	310,125	307,999	299,668	293,304	289,324	286,270	282,756	277,422	273,770	274,958	274,958	†305,833
Heavy in California	15,026	15,563	16,069	16,887	17,353	17,425	17,646	17,575	17,535	17,143	16,765	16,467	16,467	14,505
Natural gasoline	4,951	5,017	5,531	6,179	6,548	6,951	7,614	8,022	8,159	6,771	5,742	4,830	4,830	4,758
Refined products	249,328	255,837	257,384	261,888	267,658	266,524	270,069	268,040	268,137	269,336	267,438	259,665	259,665	†239,901
Total, all oils	576,242	583,493	589,109	592,953	591,227	584,204	584,653	579,907	576,587	570,672	563,715	555,920	555,920	564,997

* Increase. † For comparison with 1938.

WORLD-WIDE DEVELOPMENTS

Edited by WM. V. GROSS, Associate Editor

Mexico

Expropriation compromise is seen as possibility

A positive drive to effect a compromise solution of the conflict between the government and expropriated oil companies may be initiated if Francisco Castillo Najera, Mexican ambassador to Washington, succeeds Eduardo Hay as Mexico's foreign minister. A Mexico City newspaper says such a development is probable, contingent, of course, upon verity of reports that President Cardenas contemplates an early shake-up of the cabinet.

Najera, who was scheduled to spend the holiday season in Mexico City, has taken part on several occasions in negotiations directed at a solution of the oil problem. Some think his elevation to post of foreign minister might indicate a favorable turn in Mexico's attitude toward settlement of the controversy.

Petroleos Mexicanos, the government's oil administrative body, has been seriously handicapped since the properties were taken over by failure to develop export markets sufficiently important to take care of production in excess of domestic requirements.

Hull-Richberg hold "conversation" on Mexico

Secretary of State Cordell Hull last week at Washington discussed with Donald R. Richberg, representative of American oil companies, some of the problems of the Mexican oil expropriation raised by the recent validation of that action by the Mexican supreme court.

The Secretary refused to reveal details of the conference, saying that the conversations were to be continued and that nothing definite can yet be disclosed.

It was pointed out that following the Mexican court decision Hull announced that he proposed to hold conferences with the affected American oil companies and their representatives. The meeting with Richberg, he said, was not of such a definite, final or decisive nature in any way as to enable him to announce any developments.

The Secretary declined to say whether the State Department has given consideration to the possibility of requesting Mexico to submit the controversy to arbitration.

Argentina

Increase in Argentinian production is indicated

Argentina will show an increase in crude-oil production of better than 13 percent this year if figures representing recovery from government wells of Yacimientos Petroliferos Fiscales can be used as a yardstick. These wells produced 8,351,308 barrels in the first 10 months of the year, as against 7,348,373 barrels in the corresponding period of 1938. Yacimientos Petroliferos Fiscales controls more production than any other organization in the Argentine.

Subsidizes production of alcohol for motor fuel

The Swedish Riksdag has passed a government bill to increase the production of sulphite alcohol for motor fuels. It appropriated 5,000,000 crowns (today's rate of exchange: 4.20 Swedish crowns to $1.00 U. S. currency) as grants-in-aid to sulphite alcohol mills for the purchase of new equipment.

East Indies

Netherlands Indies due to show production increase

Fields of Netherlands Indies should show a production increase in 1939 in excess of 3,000,000 barrels over the amount produced in 1938 if one may use the first three quarters of each year for a basis of comparison.

Figures from the Central Bureau of Statistics, Batavia, Java, show a cumulative total of 5,928,960.4 metric tons recovered in the first 9 months of 1939, whereas in the corresponding period of 1938 the total recovered amounted to 5,481,669.4 metric tons. Converting the increase of 447,291 tons on the basis of 7 barrels to the ton, it will be seen that the excess of 1939 over 1938 at the end of the September runs amounted to 3,131,037 barrels.

While the production of Netherlands Indies fields during the third quarter of 1939 represented a decrease from that of the second quarter, the figures being 1,996,630.3 metric tons and 2,017,746.9 metric tons, respectively, for the two periods—it was well above the 1,914,583.2 tons produced in the first quarter, as well as above the amount produced in any quarter of 1938.

Taken as a whole, wildcatting efforts throughout the East Indies for the first nine months of 1939 were not generally successful, though vast areas still remained undrilled. Considering the geological nature of the various islands comprising the group, it is safe to predict that wildcatting will continue actively throughout the remainder of the year and 1940, with New Guinea and Northeast Borneo possibly attracting most attention. Current war demands have added a healthier tone to the market for oil produced in the Netherlands Indies, another factor which encourages wildcatting and continued field drilling.

Palembang continues to be the leading producing district of Netherlands Indies, having accounted for 2,320,454 tons out of the total for the 9 months. This represented a substantial increase over the 2,035,761 tons contributed by fields of that district during the corresponding period of 1938.

Fields of Djambi constitute the second most important district in Netherlands Indies and the general trend of production from them is upward—899,654 tons the first 9 months of 1939 as compared with 732,471 tons in the corresponding period of 1938.

Decreases in production, however, were recorded in Java and Madura and in Tarakan. Java and Madura have been declining for some time; the production of the third quarter from fields of that district having totaled 209,400 metric tons as against 259,108 tons in the second quarter of 1938.

Details on production of Tarakan and other districts of Netherlands Indies are shown in the accompanying table.

Netherlands Indies Crude Production

Figures in Metric Tons

OIL FIELD	First Quarter		Second Quarter		Third Quarter		Three-Quarter Totals	
	1938	1939	1938*	1939	1938	1939	1938	1939
Java and Madura	251,199.4	209,853.5	259,108	198,975.4	213,675.5	209,400.9	723,982.9	618,229.8
North Sumatra	225,894.1	233,118.4	227,367	251,212.4	200,488.2	251,455.4	653,749.3	735,786.2
Palembang	638,324.6	728,419.0	696,313	789,713.5	701,123.5	802,321.8	2,035,761.1	2,320,454.3
Djambi	233,140.5	291,538.4	242,188	303,605.5	257,142.9	304,510.5	732,471.4	899,654.4
East Borneo	249,172.8	242,086.8	245,144	247,455.9	235,544.5	252,664.2	729,861.3	742,188.9
Tarakan	186,602.7	188,551.3	175,749	193,118.9	180,805.0	148,620.5	543,156.7	530,290.7
Ceram	21,137.3	21,015.8	20,076	33,665.3	21,370.4	27,657.0	62,583.7	82,338.1
Totals	1,805,471.4	1,914,583.2	1,865,948*	2,017,746.9	1,810,250.0	1,996,630.3	5,481,669.4	5,928,960.4

* Columnar total discrepancies due to fact that fractional tons were omitted for the second quarter of 1938.

U. S. FIELD OPERATIONS

Oklahoma

Start test on seismograph show northwest of Ramsey

Tulsa.—Gardner Petroleum Corporation was moving in materials for a wildcat venture in Payne County at Ahrberg 1, NEc SW SE 2-18n-1e, 2 miles northwest of Ramsey pool. A block of 1160 acres lies in sections 1, 2, 11 and 12 in 18n-1e and 34 and 35 in 19-1e. A seismograph survey indicates a separate structure from prolific Ramsey pool which has been defined in all directions. Summit Drilling Company will drill the test.

Mid-Continent Petroleum Corporation staked location for Ramsey 13, SE NW NW 18-18n-2e, being a north offset to Ramsey 6 and an east offset to Ramsey 5. At least 10 to 15 proven locations in the field remain to be drilled.

Stanolind Oil & Gas Company will take crude from the recent McClain County oil discovery, being trucked to the company's station at Beebe and put in the lines at that point. Patsy Oil Company's James 1, NW NE NE 16-5n-3e, northeast of Byars, flowed 227 barrels of 27.6 gravity oil in five hours through a quarter-inch choke. Viola lime is producing at 3490-3623 feet. Two offsets were rigging up to drill.

Three miles south of Okemah pool, Okfuskee County, Burke-Greis Oil Corporation will drill Selena Butler 1, SEc NE 19-10n-10e. Paul McIntyre et al's McMahon 1, NWc SE 36-11n-9e, north of Okemah, was drilling a Wilcox-sand test. One and a quarter miles west of Allen pool, Pontotoc County, Huddleson and Delaney staked location for King 1, NEc NW 32-5n-8e.

In Lincoln County, Deep Rock Oil Company were moving in at Cleer 1, SW SE SW 6-15n-5e, northwest of Kendrick, location on a 600-acre block. West of Shamrock pool, Murray & Griffey and R. L. Kemp staked Musquat 1, NE SE NW 36-17n-6e. Tiger Mountain Oil Company staked Grover 1, NE SE NW 5-14n-3e, southwest of Hoyt pool.

Atlantic Refining Company et al's Netha 2, North Shawnee pool, Pottawatomie County, NE SE NE 24-11n-4e, swabbed 413 barrels the first 12 hours and later rated 35 barrels of 35.5-gravity crude per hour to make the second producer for the area. Wilcox sand was topped at 4867 feet and drilled to 4890 feet. The well failed to flow through casing and a pump may be installed.

Alma Oil Company's Johnson 4, NW SE SW 19-6n-5e, Johnson pool of Pottawatomie County, flowed 475 barrels in 22 hours. Earlsboro sand was shot with 40 quarts at 2868-97 feet to bring in the fifth producer for the pool.

Shell Oil Company's Epperson 1, NWc SW 9-12n-10e, 3 miles north of Cary pool, Okfuskee County, topped stained Hunton lime at 3486 feet and was still drilling in hard lime below 3550 feet.

Phillips Petroleum Company had a machine at Warner 2, NW NE SE 19-7n-17w, Hobart pool, Kiowa County.

Frederick pool, Tillman County, saw a new outpost location made as Johnson Drilling Company started Longacre 1, NEc SE 32-2s-17w, a farmout from Sun Oil Company.

Continental Oil Company completed Goodboy 1, C SE NW 18-25n-2e, flank of Ponca City pool, Kay County, for 67 barrels per day. Pay is Mississippi chat at 3873 feet. West of the pool, Malernee Oil Company's Harris 1, C SW NE 14-25n-1e, was rotating below 3075 feet. Marland Oil Company will shortly start work at Wood 1, NWc SW 19-25n-1w, southwest of Tonkawa.

Sinclair-Prairie Oil Company's German 1, SW NW NW 1-6n-13w, southeast of Carnegie, Caddo County, was nearing Wilcox sand at 9000 feet. This wildcat is the deepest drilling in Oklahoma.

Owensboro, Ky.—Sun Oil Company's R. A. Trigg 1, wildcat in the Corydon Section of Henderson County, shut down at 2510 feet. To resume after the holidays, operators expect the McClosky at about 2600 feet.

Cameron & Son were preparing to spud a wildcat test on the Sallie Barnes tract, east of Hebbardsville, Henderson County.

Illinois

Three new producing spots are opened during week

Mattoon, Ill.—Henderson Brothers' Ostermeyer 1, C NW NW NW 30-10n-4w, Raymond Township, opened a shallow Montgomery County pool last week when it showed for a 50-barrel well in the Pottsville sand. Fourteen feet of saturation was topped at 615 feet, and crude tested 31.3 gravity. The wildcat will be shot and placed on pump. Operators will drill a Devonian test on the same lease.

Second pool of the week was in Clinton County, opened by Pray & Bell's Knolhoff 1, SW 2-1n-2e. It pumped 50 barrels in 24 hours from 5 feet of Benoist sand saturation below 1324 feet. A Devonian test will also be drilled on this farm early this month.

A third wildcat, awaiting a production test, promised another pool. In White County, Bishop, Harrington & Bush's G. Griffin 1, S SE SE SW 28-3s-9e, Burnt Prairie Township, perforated casing opposite the McClosky, from 3478 to 3488 feet, and flowed by heads. It is 3 miles south of the Sloan pool of Wayne County. Saturation was also recovered in the Rosiclare.

The season's first snow blanketed the Illinois basin last week, combining with the holiday to generally retard operations. Alternate thaws and freezes during the next two months, and extremely wet weather in March and April will make movement of equipment difficult and can be expected to slow down work in most areas.

In the Centralia townsite pool on the Marion-Clinton County line, Louis Lilly et al's Dave Gum 1 initialed 715 barrels of oil when completed as the area's first Devonian well. Location is 450 feet from the east line, NE Lot 24, Block 1, Pullen Subdivision No. 3. Four other Devonian tests are underway in this pool, all without the city limits.

The door was opened to Devonian development of that part of the Centralia field lying within the city limits when the city council voted to permit 2 wells to a city block when a $10,000 surety bond is filed with permit application. Two applications accompanied by bonds had been filed last week, but permits were held up on the ground that minor details of the ordinance had not been complied with.

In the Lake Centralia-Salem field, the state's largest producing area, 35 Devonian tests were among the area's 78 active operations.

Plugs were drilled in the first deep test in the Patoka field. Jones & Deaton's P. J. Majonnier 2, NE NE SW 28-4n-1e, had cored saturation at three intervals between 2889 and 2950 feet.

Indiana

Gibson County wildcat fails to shut off Cypress water

Evansville, Ind.—Continental Oil Company's J. C. Blood 1, 330 feet from the north line and 330 feet from the west line, NW SW 13-3s-13w, 3 miles east of production in the Griffin field of Gibson County, failed to shut off salt water which showed during a production test of the Cypress. The wildcat was drilling ahead at 2550 feet, and will be taken to the McClosky. Cypress saturation was between 2366 and 2390 feet.

Halstead Petroleum Company's Dr. Virgil McCarthy 1, S½ NE NW 12-2s-11w, Patoka Township, western Gibson County, was abandoned at 1850 feet.

Kentucky Natural Gas Company last week completed its line connecting the Rockport gas field of Spencer County to its system in Kentucky. Thirteen wells have been drilled in this area, as yet undefined, and approximately 15 locations in the proven area are yet to be drilled. .

Kansas

Cowley County wildcat flows 120 barrels hour from opener

Wichita.—Jock Garden and others tested their pool opener in Cowley County to show for the largest Bartlesville sand producer in the vicinity. Rahn 1, SWc NW 13-34-5e, 10 miles east of Arkansas City gas pool, flowed 120 barrels the first hour after a 40-quart shot at 2915-31 feet. For 20 minutes it flowed wild over the rig and prior to shooting made 62 barrels in 20 minutes. Additional tankage is being erected and an outlet sought. Originally this well drilled to 3435 feet in dry Arbuckle lime and then plugged back to 2950 feet. Crude gravity was 38.3, corrected.

One well, Wolf pool, Barton County, was extended three-quarters mile southeastward as Crown Petroleum Corporation's Ernsting 1, CWL NE SE 1-20-12w, filled 700 feet with oil. Pay is Arbuckle lime at 3342-75 feet.

Saco Oil Company completed a pool opener at Habiger 1, SEc SW 12-18-10w, southwest of the one-well Bredfeldt pool, Rice County. It has been designated West Bredfeldt and made a potential of 374 barrels daily. Arbuckle lime was drilled from 3249 to 3268 feet. It is awaiting pipe line connection.

Derby Oil Company extended Krier pool, Barton County, a half mile to the northeast. Esfeld 1, SWc NW 29-16-11w, established a potential of 724 barrels daily. Gorham sand is pay horizon at 3314 feet. R. E. Day et al's Feltes 1, SEc NE 14-16-12w, Coal Creek opener, pumped 375 barrels of 42-gravity crude in 24 hours and was completed for that gauge. South of Clawson pool, Barton County, Pulse et al's Knop 1, 6-20-11w, topped Lansing-Kansas City lime at 3076 feet and were drilling below 3215 feet. A show of oil in the lime was reported.

Trigg's Milles 1, C W½ SW 36-21-12w, two locations southeast of production in Max pool, Stafford County, pumped 423 barrels in 24 hours after treatment with 3500 gallons of acid. Total depth is 3578 feet in Arbuckle lime. Zenith pool was moved a half-mile westward when Landon & Estes' Equitable Life 1, NEc 15-24-11w, flowed 50 barrels natural in 1 hour from Misener sand at 3778 feet. However, drilling was resumed.

Cities Service Oil Company's Culbertson 1, CSL SE NE 26-18-10w, filled 1800 feet with oil to give East Orth pool, Rice County, its second producer. Pay is 3175 feet in Quartzite. Same operators Padlena 1, SEc 26-14-10w, 10 miles north of Stoltenberg, Ellsworth County, failed to show after acidizing Arbuckle lime with 10,000 gallons. Lansing lime will be tested where a show of oil was reported around 2836 feet.

Westgate-Greenland Oil Company's Chindberg 1, C N½ NE SE 18-18-1w, 5 miles south of Roxbury pool, McPherson County, made only 10 barrels of oil with some salt water at 2828-58 feet in Mississippi lime and a plug was set at 2795 feet in an effort to shut off the water. Prunty and others staked location for Jones 1, NW SW 32-21-1w, 1 mile northwest of Graber pool, McPherson County.

North of Bornholdt pool, McPherson County, Central Petroleum Company and Springrose Drilling Company's Swanson 1, C N½ NW NW 18-20-5w, will drill plugs in saturated Mississippi lime at 3304-19 feet. Two dry holes have been drilled east of this wildcat although this test checked structurally on par with production in Hodge pool, to the west.

Lario Oil & Gas Company's Wiesner 1, C N½ SWc 11-12-18w, ¼ mile west of Walters pool, Ellis County, was drilling with rotary tools. Earl Wakefield et al's Schmidtberger 1, CNL NE SW 17-13-15w, north of Gorham pool, Russell County was rigging up to drill. In the same county, Shell Oil Company staked Dumler 1, SE NE NW 24-14-14w, ¾ mile from Gurney pool.

West Texas

Pecos County Ordovician test has encouraging show

Midland, Texas.—Pecos County's prospective Ordovician strike by Olson Drilling Company and Bryce McCandless on the V. W. Crockett tract, T. C. Ry. Section 5, Block 110, was awaiting swabbing test late last week after taking in 40 feet of the Ellenberger section in coring to 4445 feet, or 1944 feet sub sea. Formation tester used at 4384-4445 feet prior to cementing 7-inch pipe at 4393 feet yielded some encouragement for production by recovering small show of oil and gas with 30 feet of drilling fluid. Crockett 1 is 2½ miles south by west of nearest Ellenberger production in the Apco pool.

Crockett County's bid for its first Ordovician production remained uncertain as testing was resumed on Continental Oil Company et al's Todd 1, C S½ NE SW GC&SF Section 30, Block WX, after plugging back from water in Ellenberger at 7010 feet to 6780 feet. No shows were reported in swabbing drilling fluid down to the 2500-foot level. It will be acidized before plugging back for a test near the Simpson-Ellenberger contact at 6256 feet.

An outstanding producer for the Magnolia-Sealy pool, northern Ward County, was scored by Mid-Continent Petroleum Corporation's Geo. Sealy-Magnolia 4, NE NE SW Section 47, Block F, rated at 3906 barrels of 30-gravity oil natural from top of main pay at 3046 feet, or 325 feet sub sea. On preliminary test this well gauged 480 barrels oil in 2-1/6 hours, including 230 barrels the last 50 minutes. Magnolia Petroleum Company's Sealy 2-43, located 1¾ miles south of the pool and on a separate geological feature, is milling on 3 joints of drill pipe lost while plugging back from 3019 feet by stages to complete in upper lime, which showed an exceptionally large gas yield with oil in the lower section.

Landreth Production Corporation and Shell Oil Company's Johnson 1-A, SE SE NW T&P Section 43, Block 43, T-1-S, situated on a strike between the Foster-Johnson and Goldsmith fields, Ector County, resumed drilling after

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failing to produce following treatment with 1000 gallons of acid at 4310 feet. Richmond Drilling Company-Rhodes & Tompkins' T. P. Land Trust-Amerada 1, SW SW SE T&P Section 19, Block 42, T-1-S, 1¾ miles southeast of production in the North Cowden field, found water at the projected oil level, and was drilling at 4345 feet.

Stanolind Oil & Gas Company's T. S. Riley 1, C SW SE D&W Section 11, Block H, northeastern Gaines County wildcat and 3½ miles northwest of the Cedar Lake 3-well pool, moved in cleanout machine after failing to respond to 730-quart nitro shot in broken saturation at 4762-4864 feet. A small pumper is in prospect, as bailing test prior to shot yielded one barrel of oil per hour.

Texas schedules new allowable hearings

The Texas Railroad Commission has scheduled several more hearings to be held in Austin early in January, most of which involve applications for new allowables.

On January 5, the commission will hear the application for an increase in the allowable for wells in the North Government Wells field and the South Government Wells field in Duval County. An application for an increased allowable for the Withers field, Wharton County, is set for the same day. The commission will also hear on that day an application for an increase in the allowable for the Humble field in Harris County.

At a hearing on January 10, the commission will consider permanent operating rules for the new Rosenberg field in Fort Bend County, and also for the Tom O'Connor field in Refugio County. Emergency spacing rules for both fields were promulgated by the commission last week.

To enlarge Corpus Christi oil loading facilities

Further expansion of the crude and refined oil loading facilities in the deep water port in Corpus Christi, Texas, is due to get underway shortly. The Atlantic, Gulf & Pacific Company of New York was announced as the low bidder among five contractors on dredging of the Corpus Christi-Port Aransas ship channel and dredging in the turning basin. Following opening of bids at the office of the United States Engineer in Galveston that the low figure submitted was 6.74 cents per cubic yard. The specifications called for dredging some 6,159,300 cubic yards of material.

Duane Orr, assistant engineer for the Nueces County Navigation District, explained that approximately 3,000,000 cubic yards of this would be material dredged from the ship channel, constituting regular maintenance work, done from year to year. The dredging there is to maintain a depth of 34 feet in the waterway.

The turning basing dredging, in which an additional 3,000,00 cubic yards of material will be removed, will provide a basin 2500 feet longer and make it 1000 feet wide uniformly. This will give additional wharfage.

Indications are that work on this will begin in January or February.

North Texas

Deep-lime strike in Clay; depth record in Montague

Wichita Falls. — The fifth deep-lime discovery this year for Clay County was assured last mid-week by a test on a geophysical prospect near the southwest corner of the county. The strike was made by Shell Oil Company's H. Henderson 1, NW Section 2605, TE&L Company Survey, from upper Strawn at 3419-32 feet. Formation tester used on this horizon yielded 2600 feet of high-gravity oil in 15 minutes. Casing has been landed to try for a completion before the year-end. Henderson 1 is 9½ miles south and 3 miles west of the Burns-Browning 3-well pool, which produces from Strawn near the 4450-foot level, and is on a north strike from the Bryson district, west central Jack County.

Frabor-Hodges Corporation and Sinclair Prairie Oil Company's Scaling 1, Block 8, G. P. Meade Survey, mile southeast of the partnership's 4100-foot pumping wildcat, proved dry in the Strawn and Caddo and prepared to plug at 5502 feet.

A new producing depth record for North Texas was in prospect late last week as small amount of free oil appeared in Walter H. Gant and Continental Oil Company's Brown 1, western Montague County wildcat, while unloading hole by swabbing. The hole is bottomed at 6904 feet in green shale, tentatively identified as the Simpson, and 7-inch was cemented at 6843 feet in lower Bend, topped at 6112 feet. The hole will be acidized, then deepened possibly to the Ellenberger. If necessary to make a producer, the casing will be perforated opposite oil saturation in the upper Bend. A large initial output and sustained production is required to attract additional development in the area because of the cost of drilling such tests.

Hull-Silk Takes Lead

Authorization of 15 additional tests the past week for the Hull-Silk field, which was recently linked with the Sikes pool, involves competitive drilling that will enable this Archer County deep area to displace the K-M-A field as the most active in the district. Currently the former has 48 operations listed, including 22 tests drilling or in process of completion. K-M-A has 24 tests down to the Strawn horizon and 15 drilling above the casing point, while miscellaneous listings make a total of 58 operations, including 9 locations added the past week.

Search for production in the Ellenberger horizon in the K-M-A field continues to meet with disappointing results. The most recent try involves C. W. Boller et al's S. Y. Collins 2, northeast corner of Chas. Roberts Survey, A-540, near west edge of the field, with water showing in Ellenberger at 4510-92 feet. It was deepened from 3990 feet, where nitro shot failed to yield commercial production from the Strawn lime, topped at 3842 feet. Bridwell Oil Company's Fred Cone 1, J. M. Sharpe Survey, A-262, east edge test, was plugged the past week after drilling to 4404 feet.

Eight rotary rigs are active in the Walnut Bend deep pool, northeastern Cooke County, with 4 companies carrying on development. This Strawn and Simpson pay area has 33 wells on production, including 19 on Sinclair Prairie Oil Company's Best and McGeorge leases. Two late completions by Ed. Cox and Jake Hamon on acreage farmed out by The Texas Company boosted their total to 13 flowing wells. This partnership's K. Neu-Texaco 9-B, BBB&C Survey, logged 6 oil saturated zones between 4655-4915 feet, and flowed at rate of 688 barrels initial. Perforated liner was set inside 5½-inch oil string, which was cemented at 4655 feet.

East Texas

Houston County Trinity test cores soft formation 9805 feet

Tyler, Texas.—Two Lower Trinity tests by Shell Oil Company are commanding the most attention among prospects under way in the East Texas Woodbine belt. The company's Dorsey 1, Percilla area, northeastern Houston County, is credited with having entered the Second Glen Rose zone in drilling soft formation at 9801-05 feet. Coring was ordered at this point, top of massive anhydrite was logged at 9670-80 feet, with an elevation of 393 feet. The original drilling contract was fulfilled at 9800 feet, and contractor is being paid $17.50 per foot below the level. In the event the lower section fails to produce, Dorsey 1 will be plugged back to test show of oil and gas passed up in Upper Glen Rose at 8541-76 feet.

Shell Oil Company's Campbell 1, 2½ miles northeast of the Chapel Hill gas-distillate pool, eastern Smith County, has failed to encounter porosity or saturation of any consequence in the Lower Glen Rose, topped at 7370 feet, after coring and drilling at 8050 feet. The discovery is producing at 7402-7528 feet. Completion of a gas-distillate well is assured by plugging back to Paluxy pay passed up at 5749-5821 feet.

Sun Oil Company's Huddle 1, two miles south of the discovery, is checking about 100 feet low in drilling at 4260 feet. Austin Chalk was logged at 3754-3941 feet with an elevation of 449 feet. A protection string of pipe will be cemented on top of the Georgetown lime, which is due near the 4400-foot level.

Camp County's first Lower Trinity test being drilled by Harry Moss and William McGlothlin on the Joe Vanters tract, S. Wright Survey, 2½ miles southeast of Leesburg, was drilling sandy-shale at 6225 feet. First anhydrite stringer was reported at 6150 feet.

Two Woodbine failures were record-

ed the past week. In Freestone County, Biddle et al's Nettles 1, 7 miles northwest of Fairfield, quit in water sand at 4085-4111 feet. R. E. Lee et al's Dubose 1, J. Stockwell Survey, 3 miles southwest of Canton, Van Zandt County, also tested water in sand at 4423-4511 feet.

Will erect recycling plant at Cayuga

Palestine, Texas.—Roeser & Pendleton, Inc., Fort Worth, has authorized erection of a 10,000,000-foot daily capacity recycling plant to utilize the production from its gas-distillate wells in the Cayuga field, Anderson County. The plant will be located on its V. W. Bowyer 200-acre lease, E. Ritter Survey, using Bowyer 1 for returning the gas to the Woodbine horizon. Gas-distillate production will be derived from 3 Woodbine wells and a 7642-foot Trinity producer. The latter yields 55 barrels of distillate per million cubic feet of gas on tests made through gas traps. The recycling plant is scheduled to yield about 200 barrels of 75-gravity oil daily.

Texas Panhandle

Oil development in Panhandle area is on upward trend

Pampa, Texas.—Shell Oil Company has contracted to drill about 20 wells in northeastern Carson County in acquiring operating control of 480 acres of partially developed leases held by United Crude Oil Corporation and Pansota Oil Company. The former paid $140,000 cash, and is to finance the new development, carrying the 2 affiliated concerns for ⅛ over-riding royalty. The acreage involves SW I&GN Section 11, Block 4; SW and W½NE Section 5 and W½ SW I&GN Section 3, Block 9.

Oil development in the Texas Panhandle has recorded a substantial gain in recent months with major companies setting the pace on drilling of inside locations. Stanolind Oil & Gas Company, The Texas Company, Phillips Petroleum Company and Magnolia Petroleum Company have been the most active. The district recorded 17 new tests the past week.

Indian Territory Illuminating Oil Company's S. C. Bryant 1, C NW T&NO Section 369, Block 1-T, projected Ordovician test for Sherman County, is sidetracking drill pipe that twisted off after losing returns at 2739 feet.

The oldest wildcat in the Texas Panhandle was dropped from the list of operations the past week after being worked on, except for temporary shutdowns, since May, 1931. This prolonged test was drilled by Chicken Creek Oil Company. Ledrick Bros. 1, NE NW G&M Section 55, Block C, Roberts County, drilled to the 6860-foot level, where it bottomed in granite wash with hole full of salt water. Eight strings of casing, ranging from 20-inch surface pipe to 3-inch at 6365 feet, were used in drilling alternately with cable tools and rotary.

Southwest Texas

Saxet well finds deepest pay in lower Gulf Coast

Corpus Christi.—Coring a well saturated oil and gas sand at 9913-30 feet, Hiawatha Oil & Gas Company of Corpus Christi apparently has uncovered the deepest oil production in the southwest trend of the Texas Gulf Coast in Smith 8-B, in the extreme northwestern portion of the Saxet field in an electric log run. It is scheduled to be carried deeper than the current depth of 10,000 feet plus for a series of tests through perforations.

The well is located 450 feet south of the center of Shell Road and 330 feet from the west line of Block 35. It is in the heart of a development ranging from 4000 to 6700 feet, where both crude and distillate are produced. The new test is about 16,000 feet northwest of Richardson Petroleum Company's Cain and Sechrist 24, which late last year blew out while drilling at 9927 feet. That test then was completed through the drill stem, flowing about 175 barrels of distillate along with a large volume of gas through 3/16-inch choke under 3600 pounds working pressure.

It is not known whether or not the sands are the same. This, however, is not considered likely. The new discovery is on the upthrow side of the major fault which cuts the Saxet field. Some classify the new zone as being in the Vicksburg, although the general opinion is that it is in the Frio.

Completing Two Discoveries

In Victoria County keen interest centers around a development in the Victoria field, where two discovery wells are being completed. They should create an offsetting program in a series of fairly small leases.

W. Stewart Boyle's Meyer 1, 4000 feet northwest outpost to the field, was cleaning into the pits making several barrels of fluid per hour. It is said to be good for fully 150 barrels of 26.6-gravity crude per day. This well opened a new sand for the field at 4776-87 feet. The test made gas at 2500-71 feet in the discovery sand.

About 2000 feet southeast of production, Trinity Drillers, Incorporated's Moeller 1 is flowing about 3½ barrels of 19.9-gravity crude per hour along with some wash water through 7/64-inch choke, showing 600 and 800 pounds pressures. The flow is from perforations 2551-55 feet. The well cored oil and gas sand 2540-44½ feet. The discovery well was completed in the same sand as a gas producer.

The two discoveries are on Shell Oil Company farmouts, the block being originally held by that company and one of its geophysical prospects.

Jackson County's highly important test is George J. Greer's Ward Estate 1, second producer in the 5700-foot sand in the Vanderbilt-West field. The well extended that production 14,000 feet to the southeast when it came in flowing at the rate of about 180 barrels per day through ⅛-inch choke under 750 pounds working pressure. The test cored sand at 5725-52 feet and was carried to 5760 feet. Perforations were made 5725-35 feet. The well was drilled under contract by Trinity Drillers, Incorporated.

Green prospect discovery well is being reworked

Beeville, Texas.—Clyde Echols et al's discovery of production on the Green prospect in Karnes County was being reworked late in the week in an effort to induce a flow of crude oil. The test was first completed in the Pettus sand as a dry gasser despite the fact that cores and drill stem tests indicated an oil producer.

Newberry 1, Block 30, Martinez Grant, and four miles southeast of Green, cored sand with oil and gas show 2940-52 feet. The lower portion of the sand carried 8 percent saturation. The hole was carried to 3008 feet, where casing was set. The first perforations were made 2942-47 feet. New perforations are scheduled to be made 2947-52 feet.

Showings in Zapata County wildcats being tested

Laredo.—Finding showings in the Yegua and Mount Selman formations in Zapata County wildcats has enhanced interest in the southern portion of Mirando district. Two wells were at the testing stage late in the week with their successful outcomes promising enlivened drilling programs during 1940.

Ed Mathis' J. M. G. Martinez 96, in Charco Redondo Grant field, was just below 3000 feet, reportedly waiting on cement after setting casing. The test which has an elevation of 420 feet, derrick floor, found a series of sands through the Jackson and into the Yegua series. These will be tested via gun perforation.

On El Grullo prospect, five miles west of the same pool, J. P. Martin's Vela 1, Lot 59, Share 2, was coring around 3050 feet. It showed oily mud with a slight gas blow on two drill-stem tests bewteen 2967-3015 feet. The well is to go to 3500 feet and likely will be tested up the hole through a series of perforations.

The Mirando trend generally reported a number of abandonments. F. J. Hynes et al's Bruni 3, Survey 2184, Webb County, topped Mirando sand 2419 feet, but was carried to the Pettus and abandoned at 2850 feet. It was the third well on an interesting project. Lern Oil Corporation's Spain 1, a mile north outpost to Carolina-Texas, found salt water sands at 1730-48 feet and 2220-32 feet and was abandoned at 2314 feet. W. C. McBride, Inc.'s Laurel 1, ½ mile north of the North Killam production, showed gas through perforations at 2580-81½ feet in the Rosenberg sand, but was abandoned at 2717 feet.

J. B. Blanchard et al's Parr 2, Section 22, 2 miles northwest of Muralla field, quit at 4608 feet without finding sufficient shows in the Pettus sand.

Hiawatha Oil & Gas Company's southeastern outpost to Longhorn field in Duval County proved a failure and

was abandoned at 6011 feet. H. J. Porter's southwest extension attempt to the Chiltipin field proved of no avail when Garcia 1, Section 411, was abandoned at 4923 feet.

W. C. McBride, Inc., chalked up a failure in an attempt to add one mile to the north end of Munson field in McMullen County. Nueces Land and Live Stock Company 1, Section 90, was abandoned at 1829 feet.

San Salvador to have deep tests and recycling plant

McAllen.—Drilling of three 9000-foot wells and the construction of a large recycling plant is in the offing for San Salvador field, east of Edinburg, Hidalgo County. This is the second project of this type expected in 1940 for deep Hidalgo County pools.

Gulf States Oil Company awarded contract to Rudel Drilling Company and preparations are being made to move in rig on the north central portion of Share 156, San Salvador del Tule Grant, for the first well. If it makes a satisfactory producer, the other two wells will be drilled. These wells, together with the discovery producer, will be tied into the recycling plant.

Details of the above project are unknown, but it is understood that adjacent lease owners have contributed toward the operation and that the leases will be unitized and operated by one company.

McCollum Exploration Company is planning to build a large plant in La-Blanca field after the first of the year. It is expected that this concern will sink at east six more wells on the structure to provide input and output producers.

Clopton and Mitchell have abandoned the second well on the Seabury structure of Starr County after finding slight oil and gas showings in the 1200- and 1300-foot sands. The well was Margaret Seabury 1, 660 feet north and 660 feet west of the original operation. F. W. Seabury, the discovery, is flowing about 25 barrels of low gravity crude per day through open tubing from perforations 1328-33 feet.

Oil and distillate shows in Garwood Wilcox test

San Antonio.—Sparta-Wilcox development in South Texas Gulf Coast gained one new operation and another was testing that formation. Both wells are of vital importance to the future of the trend in this area.

About 2300 feet southeast of the Garwood, Cockfield sand production, Davis & Company's J. R. Davis 1-A, was coring in Wilcox formation below 10,190 feet, and due to make a series of tests. The well topped the main Wilcox zone around 9764 feet, where a saturated oil sand was picked up. A string of 7-inch casing was landed at 9780 feet and the hole drilled ahead. Some 400 feet of shale, sandy shale and streaks of sand have been drilled and cored, all carrying gas with good distillate odor.

It is expected that liner will be set around 10,250 feet and perforations made for production tests. Should the well fail in the Wilcox, it is planned to complete in a sand zone in the Carrizo at 9485-9527 feet, where the well showed for a distillate producer.

Anderson Prichard Oil Corporation and Mills Bennett Production Company have signed contracts for a new 8100-foot Wilcox sand test in the West Tuleta field of Bee County. The first well, Robinson 1, was carried to 7921 feet, where drill pipe stuck when the test attempted to get away under heavy gas pressure. The well was sidetracked and drilled to 4701 feet, liner being set at that level. The pipe was perforated at 4467-72 feet, where a new Yegua sand was opened. The well flowed at the rate of 18 barrels of high gravity oil, 8 percent salt water, and several million cubic feet of gas per day through ⅛-inch choke under 1200 pounds working pressure. It was believed to be in the Wilcox formation at the time it attempted to blow out.

Tide Water Associated Oil Company, likewise, is expected to drill another Sparta-Wilcox well following the failure of A. M. Bruni 7, Bruni field, Webb County, to reach the desired depth. The well went to 8959 feet, 51 feet short of the contract, then blew out, sticking drill stem. The well is now being completed in the Queen City sand, opening that horizon for the field. It made squeeze jobs at 6100-10 feet and at 4200-6 feet, following which perforations were made 5655-65 feet for completion.

NLRB banishes Magnolia employees' organization

The National Labor Relations Board, sitting in Washington, last week ordered Magnolia Petroleum Company to refuse recognition to Employees' Independent Union of Oil and Refinery Workers at the Beaumont refinery.

Texas Gulf Coast

Second test at Rosenberg is nearing producing sand

Houston.—Fred Browning's Socha 1, which is expected to furnish the first real information on production at Rosenberg, Fort Bend County, late last week was coring at 7740 feet in sand topped at 7713 feet, and showing only a slight odor of gas and no oil. Location is 1600 feet west of H. C. Cockburn's Dzierzanowski 1, discovery well, which produced 81 barrels of 55-gravity oil through drill-stem stuck at 7743 feet. Socha 1 is running normal with the discovery, and by avoiding the blowout which prevented normal completion of that well, should get some information on sand thickness, etc. Humble Oil & Refining Company, purchaser of Cockburn's interest in the field, has made location for Skripka 1, east offset to the discovery.

Over three miles northeast of the Rosenberg field, Magnolia Petroleum Company is preparing to perforate again in Huntington 1, H. Scott League. Last week, perforated at 8662 to 8672 feet with 24 shots a 25-minute drill-stem test through ¼- and ⅜-inch chokes, showed 850 feet of salt water. Bottomhole pressure was 1700 pounds. The hole has been plugged back and will be perforated in the 8259 to 8264-foot horizon where sandy shale which had an odor of oil was cored. Hole was drilled to 8698 feet and 7-inch casing set at 8550 feet.

Production at Thompson, Ft. Bend County, was extended 2000 feet southwest last week when Humble Oil & Refining Company completed Wolters A-3, R. Peebles Survey, flowing 11 barrels of 24.2-gravity oil per hour through a ¼-inch choke with a tubing pressure of 350 pounds. The well is bottomed at 5423 feet and 5½-inch casing was set at 5390 feet. Side wall cores showed oil sand at 5356 and at 5364 feet. Gas sand was logged at 5271 and 5350 feet.

In the Juliff area, Ft. Bend County, Gulf Oil Corporation's R. Brown 1, Wm. Pettus Survey, was abandoned at 8500 feet after coring a gas sand at 8370 to 8380 feet. The well attempted to blow out at this depth. No shows of oil were reported.

About 6000 feet northeast of the discovery well at Anchor, Brazoria County, Humble Oil & Refining Company's Mettler 1, J. De Valderas Survey, was waiting on cement to set in perforations after a squeeze job. Mettler 1 came in the previous week flowing 6 barrels of fluid per hour, 21 percent salt water, through ¼-inch choke after casing was perforated with 15 shots at 10,578 to 10,585 feet. Tubing pressure was 3100 pounds and the oil tested 38.4 degrees. The perforations were squeezed and the hole was plugged back to 10,510 feet. The company has made several new locations in the field.

About 2200 feet northwest of the discovery well at Anchor, Glen H. McCarthy's Salmon 1, Geo. Robinson Survey, was being tested at the close of the week in a new sand around 9825 feet. A test at 10,500 feet showed gas, distillate, a little oil at first and then salt water. A test a 10,540 feet also showed salt water.

Glenn H. McCarthy's Houston Farms Development 2 at Chocolate Bayou, Brazoria County, was down to 10,130 feet and is reported to have logged a new oil sand. No information has been given out. His Andrau 1, ¼ mile southwest of the discovery well at Chocolate Bayou was drilling in shale at 10,100 feet at the end of the week. It is also below the 9800-foot producing horizon found in the discovery well.

Another failure was reported in the Sandy Point area, Brazoria County, last week when Frazier & Mayo's Barrington State Prison Farms 1, A. McFarland Survey, was abandoned at 9151 feet in shale. The well had a slight show of gas in a core at 8267 to 8280 feet. Salt water sands were found around 7091 feet, 7175 feet and 7204 feet. The well is about 1700 feet west and south of Hamman Exploration Company's State 1, which was abandoned some time ago after showing for a producer in the Vicksburg formation.

The thickest body of oil sand to be

logged at South China, Jefferson County, was found 4000 feet southeast of production in a new horizon last week by Echols, Hebert & Smith's Guiterman 1, C. T. Gaylor Survey. The sand was logged electrically at 7490 to 7520 feet. Sand was cored at 7490 to 7540 feet, the top 30 feet showing oil and bottom 20 feet a trace of water. The hole is bottomed at 8005 feet and casing is being set for a production test. The field, discovered by the above operators, is producing from 7803 to 7888 feet.

A mile northwest of production at Cedar Point, Chambers County, Standard Oil Company of Texas' State 61-120, was abandoned at 6400 feet after coring salt water sand in the Frio formation at 6325 to 6335 feet. No shows of oil were reported.

The Cypress prospect, Harris County, received some attention last week when oil sands were cored at 6515 to 6530 feet in the Yegua formation in Gulf Oil Corporation's Roberts 1, A. Roberts Survey. A drill-stem test from 6513 to 6545 feet recovered 500 feet of salt water. The hole was down to 6860 feet at the end of the week.

Lissie prospect, Wharton County, received a setback when Bennett & Campbell's Harrison & Mitchell 1, GH&H Section 21, was abandoned at 7120 feet after coring salt water sands at 6090 feet.

On the East Montgomery prospect, Montgomery County, T. J. Wood et al's Fultz 1, Wm. C. Clark Survey, was abandoned at 5034 feet in Cockfield, after coring salt water sands at 4237 to 4257 feet.

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Louisiana Gulf Coast

Testing tool slips in Iberia Parish wildcat

Lake Charles.—Plymouth Oil Company's McHugh Heirs 1, Iberia Parish, was preparing to drill ahead last week after making an unsuccessful drill-stem test at 7925-50 feet. The testing tool failed to hold, but 25 stands of mud cut with oil were recovered. The first drill-stem test made on the wildcat at 7277 feet showed oil and salt water, but was not considered successful.

Delta Farms Looms

Delta Farms prospect, Lafourche Parish, will probably be the next oil field in the Louisiana Gulf Coast. Last week Tide Water Associated Oil Company took side wall cores in Delta Farms 1 at 11,277 feet, 11,295 feet, 11,300 feet, 11,305 feet and 11,313 feet. The cores showed good porosity and were saturated with 38-gravity oil. The company will continue to take samples down to the bottom at 11,850 feet. An electrcial log last week showed good looking sands at the following depths: 11,295 to 11,307 feet, 11,272-82 feet, 11,313-20 feet and from 11,775 to 11,804 feet. The well has also logged sands at 8748-54 feet, 8918-26 feet, 9511-21 feet, 9670 to 9720 feet, 9929-35 feet, and below 10,000 feet. According to reports, the well has not reached its main objective.

About ½ mile west of its discovery at LaPlace, St. John The Baptist Parish, Pan American Production Company has made location for Godchaux Sugars 1, Section 97-11s-7e.

Shell Oil Company's Jeanerette Lumber Company 4 at West Lake Verrett, St. Martin Parish, made a drill-stem test around the regular producing horizon last week at 8083-97 feet in 11 minutes through ¼-inch chokes, recovering 180 feet of salty mud with a trace of oil and 1620 feet of salt water. Oil sands were logged at 8086 to 8088 feet and from 8090 to 8097 feet. Up the hole two new sands were logged, one at 6988 feet and the other at 7463 feet. The latter sand is probably where the well will be completed as it showed 810 feet of 37.7-gravity oil in 10 minutes.

In the Jug Lake area, Terrebonne Parish, Continental Oil Company has abandoned Peters 1 at 12,080 feet after running an electrical log. No shows of oil were reported.

Passes Regular Pay

At LaPice, St. James Parish, Shell Oil Company's L. & I. 1, Section 39-12s-15e, was drilling in shale at 11,211 feet at the end of the week after coring a broken sand formation from 11,197 to 11,205 feet which showed oil. This is below the regular producing horizon, which is found at 10,910 to 10,915 feet.

Humble Oil & Refining Company is searching for a new sand at North Crowley, Acadia Parish, in Ohlenforst 9. The hole is bottomed at 9100 feet in shale, below the regular producing horizon. The well has cored sand and shale with a gas odor at 9010-30 feet, shale with streaks of sand with an oil and gas show from 9030-40 feet, sand with a gas odor from 9040-60 feet, and sandy shale with a gas odor from 9060-70 feet.

Humble has abandoned another well at Perkins, Calcasieu Parish. Edgewood Land & Logging Company 3 was stopped at 7386 feet after failing to pick up the regular producing sands.

Imports

[*Continued from Page 47*]

has eliminated the threat of a flood of Mexican oil coming in under the impetus of the excise tax reduction in the Venezuelan trade agreement, Brown pointed out that over a period of several years the association had sought to secure State Department support for quotas.

But, he said, "the State Department at each of these conferences refused to even consider the possibility of establishing such import quotas which were sought by the domestic industry to meet the situation created by unregulated imports," and in 1936 Secretary Hull put his opposition into writing in a letter to Chairman Robert L. Doughton of the House Ways and Means Committee.

Objecting to a quota provision in a pending oil bill, the secretary expressed the view that, if adopted, "It would greatly handicap our effort to lessen the quota obstacles faced by American agriculture, and in this way prove disadvantageous to American farmers who are in turn consumers of American petroleum products."

At that time, Brown said, Hull told Chairman Doughton that "among all the trade restrictions encountered abroad by American exports and encountered by this government in the negotiation of trade agreements, quotas have proved among the most troublesome and the most restrictive. This government has accordingly been particularly opposed to the extension of the quota system as a form of trade regulation."

"When the independents in the petroleum industry desired the State Department to approve import quotas for the protection of the domestic industry, the State Department was unwilling to even consider this proposal and offered excellent reasons for that refusal," Brown commented. "Today the State Department finds equally excellent reasons for using the quota system in order to reserve the present companies who are the large importers of foreign oil the special privilege granted to them by this excise tax reduction."

HARRY C. WIESS, president of Humble Oil & Refining Company, was recently chosen by ex-President Herbert Hoover to head the drive for Finnish relief funds in Houston. Weiss has enlisted newspapers and prominent Houstonians, among them seven oil men, to stimulate donation.

S. A. DELLAPLAIN, vice president and general manager of Southland Royalty Company, Fort Worth, has resigned because of ill health. He also withdrew as a member of the board, and this vacancy will be filled by Ralph H. Cummins, vice president.

North Louisiana

West gasser extends Sligo production half mile south

Shreveport.—The Pettet (Basal Glen Rose) lime gas/distillate producing area at Sligo, Bossier Parish, was extended ½ mile south last week by Union Producing Company's S. L. Herold A-1, NW SE 29-17n-11w, completed through perforations at 5070-5115 feet, making 30 million cubic feet of wet gas daily. Hole was drilled to 5335 feet.

H. L. Hunt and Arkansas Fuel Oil Company's Goodpine 1, NW NW 18-10n-3e, proposed 7500-foot wildcat test, 6 miles east of the shallow Urania field, LaSalle Parish, blew out gas suddenly while drilling at 3030 feet and bridged at 1200 feet. Bridges were successfully drilled out but drill collar was lost and a fishing job was under way late last week.

Stanolind Oil & Gas Company swabbed Dillon 131, C SE NE 14-21n-15w, Caddo Parish, which was drilled to 11,418 feet and then plugged back, after perforating casing from 6963-7060 feet but only a little gas was showing.

Noyes B. Livingston set 5½-inch casing on bottom at Bowman-Hicks Lumber Company, SE NE 36-9n-14w, Sabine Parish, on the southwest flank of the shallow Converse field, preparatory to testing showings in the Paluxy. Total depth is 3508 feet and casing will be perforated. A gas blowout occurred at 3421 feet and a showing was also logged at 3130-50 feet in the Paluxy, which was topped at 3130 feet; elevation is 238 feet.

A. J. Lockett has assigned to Union Producing Company and to Sam Sklar leases and producing properties he recently acquired from Socagee Oil Company in the Waskom field, Harrison County, Texas, and at Bethany, located both in Panola County, Texas, and Caddo Parish, Louisiana. Union Producing Company secured 800 acres and Sklar 1150 acres.

Arkansas

Columbia County wildcat makes gas-distillate flow

El Dorado, Ark.—Standard Oil Company of Louisiana's Petty Stave Company 1, SE SE 4-17-21, Columbia County, geophysical wildcat prospect that showed salt water when first tested in the Smackover lime after logging 15 feet of oil saturated formation, and later was plugged back, was completed last week as a gas-distillate well, gauging 168 barrels of distillate and 4 million cubic feet of gas daily through 7/64-inch tubing choke. Tubing pressure was 2325 pounds and casing pressure 2375 pounds. Total depth is 7999 feet, casing perforated from 7980-87 feet with 98 shots, after having been plugged back to 7956 feet. Six-inch casing was set at 7994 feet. It is the first gas-distillate production from the Smackover lime among South Arkansas' deep producing fields, the first of which was Buckner, opened in November, 1937.

With elevation of 263 feet, this test logged top of Nacatoch at 1790 feet; logged anhydrite from 3482-3641 feet and topped Smackover lime at 7943 feet. The area is designated Big Creek and the location two miles northwest of the town of Magnolia.

The second oil well for the Dorcheat (Experiment) Smackover lime field, a geophysical prospect, was completed in Lion Oil Refining Company's Warnock 1, C NW NW 15-18-22, Columbia County, flowing 12 barrels of oil per hour through 13/64-inch choke, after casing was perforated at 8876-88 feet. Total depth is 9020 feet. the deepest ever drilled in Arkansas.

An east edge test in the lenticular Lewisville - Stamps field, LaFayette County, producing from the Glen Rose series, was abandoned at East Texas Refining Company and associates' Davis 1, NW NE 19-16-23. Total depth is 3310 feet.

Louisiana increases allowable for January

Louisiana's daily allowable for January was increased 12,992 barrels to 268,192 barrels in the proration order issued December 22 by the State Conservation Commission. South Louisiana fields were given 205,967 barrels and North Louisiana 62,225 barrels.

Mississippi

Eighth Tinsley producer makes 525 barrels daily

Jackson, Miss.—The eighth oil well for the Tinsley Dome field, Yazoo County, was completed last week in Union Producing Company's G. C. Woodruff 3, C SE NW 13-10n-3w, gauging 525 barrels of oil in 24 hours through 22/64-inch choke, from 4596 feet, after logging oil saturation in the Selma chalk from 4570 to 4588 feet.

The same company's G. C. Woodruff 4, C NE SE 13-10n-3w, may core ahead from 4724 feet after logging oil saturation in the Eutaw from 4700-24 feet after topping Selma chalk at 4579 feet; elevation is 236 feet. Union Producing Company's Jennie Stevens 2, C NW NE 13-10n-3w, had run 7-inch casing to 4487 feet, with total depth of 4561 feet after logging oil sand from 4506-20 feet.

Hassie Hunt of Dallas, Texas, has acquired all the holdings, amounting to 1200 acres, in the Tinsley Dome field from Southern Natural Gas Company and made two locations as follows: A. G. Johnson 1, SE SE 11-10n-3w, and A. G. Johnson 2, NE SE 11-10n-3w.

Although there was some cessation of activity during the Christmas holiday period, leasing continues at a rapid pace in Mississippi. Magnolia Petroleum Company is making a heavy checkerboard leasing of all of Holmes County near seven drilling blocks as-

We've Leased This Space

. . . and 52 times a year we scratch our heads over what to say. We could tell you about Pipe, Pumps, Packers, Pistons, Plugs, Parts, Pulleys and Pyrene, but we believe Personalities have more to do with where men do business. You can buy supplies and equipment anywhere. But there are darned few places in this world today where you get willing service and first-hand appreciation. Even if you operate in California or Colombia you may some day come to Louisiana or East Texas. And this, we hope, will be our introduction.

PELICAN WELL TOOL & SUPPLY CO.

SHREVEPORT LOUISIANA

PELCO

Houston
Greggton
Houma
New Iberia
Magnolia

sembled recently in that county. Readie Ellis of Lexington has taken a 10,000-acre block in Holmes County in Township 14 north, Range 3 east with a drilling obligation to start a 5000-foot test by next February 20. Leasing and royalty buying continue brisk in Carroll County as well as in the southeast part of Montgomery County and the southwest part of Choctaw County.

Byrd-Frost and associates abandoned Gaddis Farms 1, SE SE 12-6n-3w, Hinds County wildcat, at 6342 feet, 5 feet in the Eutaw (Blossom). Elevation is 234 feet.

Walter Trout and associates have acquired an 8-acre site at Anding, 10 miles south of Yazoo City, on the Yazoo and Mississippi Valley railroad, near Tinsley Dome field, for a refinery, and are moving a plant of 1600 barrels daily capacity to the site from East Texas.

New Mexico

Lea County wells falling behind on back allowable

Hobbs, N. M.—Western Lea County recorded a wildcat failure when Culbertson & Irwin, Inc.'s Lea-Texaco 1, C NE NE 8-19s-32e, encountered sulphur water in the Permian at 3135-50 feet. It tested a structure between the Maljamar and Halfway areas. The latter has been assigned a new project, involving Westlea Oil Company's Cleveland 2-C, C N½ NW NW 21-20s-32e, a southwest outpost, after 4 faliures defined production to the south, east and west of the two pumpers.

Texas Pacific Coal & Oil Company's State 8-A, C SW SE 21-23s-36e, located in partially explored portion of the Lynn field, prepared to deepen with pressure-control equipment after failing to squeeze off 35,000,000 feet of dry gas encountered unexpectedly at 3515-3520 feet. Seven-inch pipe was cemented at 3405 feet for the oil string, excluding gas in the upper lime section.

Production of back allowable oil due Lea County fields under a special order of the conservation commission has failed to materialize at the rate anticipated by pipe line companies. A check-up reveals that properties having production credits are not capable of making up their quota and that extra withdrawals have resulted in water encroachment.

Lea County listed 6 new tests the past week as compared to 10 the previous week. The Texas Company is starting Rhodes 1-B, NE SW NE 27-26s-37e, and State 1-Y, C W½ SE NE 16-26s-37e, both in the Rhodes area, principal source of sweet gas for El Paso Natural Gas Company.

Expansion of the Barber pool, Eddy County, nearly 2 miles to the northeast occurred with completion of Neil Wills et al's Keyes 1, SE SE NW 15-20s-30e, pumping 77 barrels of 23-gravity oil in 11 hours from sand at 1586-87 feet. The hole remained filled with oil at the end of a 20-hour pumping test. This outpost logged base of salt at 1205 feet and top of Yates at 1363 feet, with an elevation of 3214 feet. The Barber pool was discovered by Wills et al in February 1937.

Michigan

Muskegon and Barry County wildcats testing showings

Mt. Pleasant, Mich.—Two wildcats, one in southwestern Michigan and the other in western Michigan, had potential oil zones under test this week. (Some of Michigan's best pools have been opened during Christmas week, e.g., Buckeye in 1936 and New Salem in 1938.)

H. C. Nelson's Kittridge 1, Section 2-12n-18w, White River Township, Muskegon County, shut down for orders at 1860 feet after drilling a water zone 10 feet below a Lower Traverse lime pay at 1850 feet. Operators reported 200 feet of oil in the 5-inch cased hole before deepening to water. It probably will be plugged back and acidized. The closest oil field is the old Muskegon pool, about 15 miles southeast.

The second wildcat commanding attention is N. A. Trexler's Bagley 1, Section 27-2n-9w, Hope Township, Barry County, which is slated to be acidized this week. The test topped Traverse lime at 1867 feet and had a pay at 1869 feet. It was bottomed at 1940 feet for test, showing about 100 feet of oil after standing 24 hours. To date Barry County is without a commercial oil field.

Several other wildcats had minor oil shows under test. Gerritsen & William's Beebe 1, Section 5-8s-16w, Cass County, logged a black oil show at 582 feet in top of Traverse, and drilling was halted to run a string of casing. Gentry Engineering Company's Christensen 2, Section 20-11n-8w, Pine Township, Montcalm County, was drilling ahead of 3315 feet after showing 50 feet of oil in 24 hours in Dundee. Top was logged at 3269 feet.

Wicklund Development Company's Haley 1, Section 16-16n-3w, Wise Township, Isabella County, ½ mile north of Wise pool, was making between 60 and 70 barrels per day from Dundee at 3713 feet, but a good test on the well was held up when the swab was lost in the tubing.

C. C. Goff's Sims 1, NE SE NW Section 24-7n-13w, Tallmadge Township, Ottawa County, ¾ mile north of Walker-Tallmadge pool, swabbed between 10 and 30 barrels per day from Traverse at 1935 feet and operators planned to acidize.

California

Expect extension attempts at Coalinga Nose field

Los Angeles.—North extension attempts are expected to be announced for Coalinga Nose, Fresno County, following completion on the northern edge last week of two large producers: Superior Oil Company's Cagle B-1, which was brought in at 8119 feet for 4440 barrels of oil and 2.6 million cubic feet of gas, and The Texas Company's Anderson 1, good for 1180 barrels at 8200 feet.

Part of the increased gas production at Coalinga Nose will be taken care of by a 20 million cubic foot natural gasoline absorption plant which Standard Oil Company of California contemplates building immediately in Section 19-19-16.

Continental Oil Company has launched three 13,200-foot projects in Wasco, northwest of Bakersfield.

Three miles west of Shafter, Kern County, and in Section 12-28-24, Continental Oil Company has announced location for a wildcat. Union Oil Company of California and Seaboard Oil Company will contribute dry-hole money, it is said.

Unusual among the week's completions was R. E. Havenstrite's Larronde 1 in West Dominguez pool, located on the Inglewood uplift northwest of Signal Hill. The outpost made 1250 barrels of 31-gravity oil from 7500 feet.

Forest City Basin

Nebraska discovery well ready for new try for production

Fall City, Neb.—Stephens & Uhri staked location for Ogle 1-A, NE NW SE 9-1n-14e, 18 miles east of Pawnee City and offsetting a dry hole in the same section, being drilled by Arab Petroleum Company in 1937. J. C. Higgins is assisting on this wildcat test while Stephens & Uhri are drilling below 750 feet at Stauffer 1, SWc NE 22-1n-13e.

Pawnee Royalty Company drilled plugs at Boice 1, C NE NE 18-1n-16e, Richardson County discovery, and a new production test was started in an effort to collect the state's bonus of $15,000 for the first commercial producer in Nebraska. It was plugged back to 2279 feet and 8-inch casing underreamed from 2240-79 feet.

Pawnee Royalty Company's Meyers 1, C NW NW 24-1n-14e, ¾ mile southwest of discovery well, was drilling in Mississippi lime around 1900 feet, slowly nearing the pay horizon and possibly the second producer for the state.

California-Nebraska Oil Limited, Stuehn 1, NWc 21-14n-37w, near Ogalalla, shut down operations at 3300 feet. Several small shows were reported but none warranted taking a drill-stem test.

Missouri well has oil show and accident at 890 feet

St. Joseph, Mo.—Roach-Vincent et al's Dillingham 1, C N½ NE SW 16-53n-34w, Platte County, had a show of free oil in Burgess sand at 890 feet and 10-inch casing was set at that depth. Tools were dropped in the hole as the cable broke.

Missouri Valley Gas & Oil Company completed its fourth producer at Long 1, SWc 7-51n-33w, Platte County, making 200,000 cubic feet of gas. Pay is Squirrel sand at 549-607 feet. Bartlesville sand failed to show at 935 feet. Bradford & Son's Renner 1, NW NE SW 5-50n-33w, Platte County, was drilling below 600 feet.

Phillips Petroleum Company set 13-inch at 1339 feet in Creston 1, C SE NE 31-71n-30w, Union County, Iowa. Drilling was resumed after cleaning out operations were completed at this depth.

UNITED STATES WELL COMPLETIONS

Company, Well and Location	Init. Prod. Bbls.	Depth
Arkansas		
Columbia County (Buckner)—		
Standard, Johnson B-1, 9-16-22	552	7290
Columbia County (Magnolia)—		
Standard, Merritt B-1, 19-17-19	750	7618
Columbia County (Wildcat-Big Creek)—		
Standard, Petty 1, 4-17-21	¶168 & 4	7999
Columbia County (Experiment-Dorcheat)—		
Lion O. R. Co., Warnock 1, 15-18-22	288	9020
La Fayette County (Lewisville-Stamps)—		
East Texas Ref. Co. et al, Davis 1, 19-16-23	*	3310
California		
Los Angeles County (Dominguez)—		
R. E. Havenstrite, Larrondi 1	1104	7543
Union, Callender 73	1014	7460
Orange County (Huntington Beach)—		
Southwest Exp. Co., State 24	218	5135
Los Angeles County (Long Beach)—		
Dye & Spath, No. 10	175	5791
A. S. Johnston Dr. Co., No. 39	107	3486
C. F. Yunker, Barbara 1	120	4000
Los Angeles County (Montebello-West)—		
M. O. C. Oil, Zinn 1	370	7606
Pueblo Oil, Pueblo 2	280	7655
Rainbow Pet. Co., Crawford 1	340	7580
Sunset Oil Co., Robinson 1	720	7602
Los Angeles County (Rosecrans-Athens)—		
Universal Consolidated, Trust 18	130	7809
Los Angeles County (Wilmington)—		
Bristol Oil, Carter 1	400	3700
D. D. Dunlap, No. 6 (LB)	90	3060
Long Beach Dev. Co. "W" (LB) 8	328	3865
"W" (LB) 9	570	4000
Union Pacific, UP (LB) 123	192	3565
UP (LB) 126	160	3659
Kern County (Canal)—		
Ohio, KCL E-16	2391	8330
Kern County (Cole's Levee)—		
Richfield Oil, KCL A-41-32	1728	9025
Fresno County (East Coalinga Eocene Pool)—		
Robert S. Lytle, No. 42-18F	2648	7660
Superior, Cagle B-1	4440	8119
Texas Co., Anderson 1	1180	8200
Kern County (Kern Front)—		
McDonald & Dearin, Movius 3	100	2245
Fresno County (Kettleman No. Dome)—		
K. N. D. A., No. 47-26Q	2000	7875
Kern County (San Emigdio Area)—		
Shell's KCL F-1	* 10,545	
Kern County (Mountain View)—		
Shell's Voorhees 3-20	* 4958	
Illinois		
Clark County—		
Trulock-Mumford, Truloc 1, sec ne 18-12n-14w	* 603	
Clay County—		
Bell, Tackett 1, n½ n½ se se 5-2n-6e	* 3361	
Clinton County—		
International Oil Co., Adams 1, se ne ne 13-3n-1w	175	1433
Shell, Kreitler 1, ne nec se 13-3n-1w	135	1449
Edwards County—		
L. N. & K. Oil Co., Broster 1, ne nw sw se 34-2s-14w	80	2652
Kacey, Bump 2, sec sw 34-2s-14w	170	2640
Effingham County—		
Algona Oil Co., Cramer 1, sec sw 27-8n-5e	* 1560	
Stewart, Rhodes 1, swc 26-8n-3e	* 1617	
Markam et al, Emmerson 2, ne se sw 31-8n-3e	90	1531
Texas, Griffith 5, se nw se 25-6n-2e	147	1611
Gulf, Small 12, nwc ne 36-6n-2e	71	1624
Small 13, se nw ne 36-6n-2e	129	1610
Ohio, Swarm 5, sw ne ne 36-6n-2e	182	1613
Carter, Wright 9, se nw ne 21-8n-3e	60	1626
Carter & Magnolia, Kimbrell 1, cel ne se nw 29-8n-3e	140	1425
Carter, Smith 3, swc se 31-8n-3e	216	1577
Madison County—		
Willis, Gwinn 1, ne swc ne 18-4n-10w	¶1	1135
Marion County—		
Texas, City of Centralia 42, sw ne nw ne 4-1n-2e	266	1881
City of Centralia 43, se ne nw ne 4-1n-2e	126	1867
City of Centralia 18, se nec 5-1n-2e	455	1818
Reed 5, sw ne nw 5-1n-2e	2058	1820
Richardson 8, sw sec 5-1n-2e	182	2060
Johnson 11, se nw se 6-1n-2e	2072	1821
Johnson 23, nw se se 6-1n-2e	1715	1831
Gibson et al, Phillips 1, se ne nw nw 7-1n-2e	356	1878
Texas, Carr 5, 35 ft e of se nw nw 8-1n-2e	2240	1880
Carr 6, ne sw nw 8-1n-2e	1966	1874
Friedrich 14, nw se ne 8-1n-2e	203	1864
Hawkins 20, c s ½ ne nw 8-1n-2e	735	1874
Bryant 14, sw ne sw nw 9-1n-2e	15	1879
Fyke 13, 28 ft n of nw ne nw 17-1n-2e	196	2105
Jett 24, se sw sw 16-2n-2e	112	2076
Magnolia, Young 28, ne ne sw ne 20-2n-2e	3889	3407
Ohio, Young 30, swc 20-2n-2e	630	2532
Texas, Sweney 5, se nw nw 20-2n-2e	196	2102
Magnolia, Young 27, c s ½ ne sw 21-2n-2e	160	2080
Texas, Friedrich 12, sw nw nw 29-2n-2e	84	1885
Stroup 8, 88 ft n of c w ½ nw nw 31-2n-2e	126	2080
Shell, Farthing 3-A, ne se sw ne 32-2n-2e	300	1878
Farthing 4-A, se ne sw ne 32-2n-2e	271	1875
Ahlf 1, nw nwc sw 18-3n-1e	67	1442
Richland County—		
Gulf, Eberhardt 3, c e ½ ne 5-3n-9e	184	2588
Pure, Klinger 1, e of c e ½ 1-4n-9e	511	2915
Wachtel 2, c s ½ se se 1-4n-9e	965	2945
Coen 4, c s ½ se ne 36-5n-9e	696	2925
Clark 2, ne se sw sw 31-5n-10e	62	2900
Wabash County—		
Smoky Oil Co., Woodward 1, sw swc ne 9-2s-13w	35	2438
Duncan, Batson 1, se nwc sw 16-2s-13w	29	2423
Gulf, Strasser 3, nw sw nw nw 16-2s-13w	24	2463
Continental, Cowling 1, sw ne sw 17-2s-13w	64	2478
Gray 3, nwc nw 29-2s-13w	75	2472
Skelly, Schrodt 2, ne nw nw 29-2s-13w	200	2467
Schrodt 4, nw ne nw 29-2s-13w	*	2844
Phillips, Parmenter 1, swc ne 7-3s-13w	25	2930
Washington County—		
Shell, Kozuszek 8, ne se nw 23-3s-3w	51	1281
Wayne County—		
Pure, Hubble 4, c w ½ se sw 4-1n-8e	525	3100
Coulter 1, c s ½ se se 33-2n-8e	418	3102
Albright, Collins 1, nw nw se 24-1s-9e	*	2525

Summary of Drilling Operations in the United States, Week Ended January 1, 1940

	WELLS COMPLETED							NEW WELLS STARTED*				
	Completions	Oil Wells	Gas Wells	Failures	Initial Production	Total 1939	Total this Date 1938	This Week	Total this Month	Total 1939	Total this Date 1938	Year Total 1938
Alabama	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Arizona	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Arkansas	5	4	.....	1	1,590	5	4	1	1	1	.....	223
California	26	24	.....	2	20,805	26	25	16	16	16	13	1,136
Colorado	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Florida	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Georgia	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Illinois*	70	63	1	6	27,446	70	.....	82	82	82	.....	893
Indiana	15	9	2	4	1,873	15	.....	.....	.....	.....	.....	.....
Kansas	30	25	.....	5	31,069	30	27	40	40	40	24	1,449
Kentucky	12	8	1	3	328	12	20	.....	.....	.....	.....	.....
Louisiana	31	23	2	6	7,412	31	14	.....	.....	.....	15	1,583
Michigan	31	17	13	11	4,770	31	23	30	30	30	17	1,419
Mississippi	4	1	1	2	525	4	.....	1	1	1	.....	.....
Montana	.....	.....	.....	.....	.....	.....	2	.....	.....	.....	.....	.....
Nebraska	.....	.....	.....	.....	.....	.....	.....	1	1	1	.....	.....
New Mexico*	14	9	1	4	5,503	14	13	11	11	11	.....	293
New York	22†	22†	.....	.....	130	22†	2†	.....	.....	.....	.....	.....
North Dakota	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Ohio	9†	6†	3	.....	17	9†	21	.....	.....	.....	.....	.....
Oklahoma	42	21	2	19	10,918	42	41	35	35	35	28	2,059
Pennsylvania	32†	31†	.....	1	43	32†	22†	.....	.....	.....	.....	.....
South Dakota	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Tennessee	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Texas	188	137	2	49	81,229	188	157	262	262	262	64	10,269
Utah	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
West Virginia	9	5	4	.....	53	9	.....	.....	.....	.....	.....	.....
Wyoming	.....	.....	.....	.....	.....	.....	18	.....	.....	.....	.....	.....
Total this week	540	405	22	113	193,711	540	389	479	479	479	161	18,752
Total last week	697	502	31	164	233,019	.....	.....	.....	.....	.....	.....	.....
Total this year	540	405	22	113	193,711	.....	.....	.....	.....	.....	.....	.....

* This tabulation includes those states where weekly data are available; figures for Illinois date from October 15, 1939; New Mexico from August 1, 1939.
† Includes water-input wells.

United States Well Completions—*Continued*

Company, Well and Location	Init. Prod. Bbls.	Depth
Weinert, McPherson 3, e ½ nw ne 4-2s-7e	800	3285
Rockwood et al, Young 1, se sw ne 29-2s-7e	42	3408
Dunlap, Vaughn 1, nec sw 34-2s-8e	38	3445
White County—		
Curry, Felix 1, nwc sw 20-3s-8e	235	2350
Superior, Ford 8, sec sw 4-5s-14w	400	2193
Ford 9, nw sw ne 9-5s-14w	300	2193
Ford 10, ne nw ne 9-5s-14w	300	2194
Exchange, Storms 3, se sw ne 14-6s-9e	384	2276
Storms 4, ne sw ne 14-6s-9e	468	2278
Lain, Storms 3, nec sw 14-6s-9e	225	2294
Eason Oil Co., Storms 1, ne se se 15-6s-9e	335	2263
Fields et al, Green 5, ne sw sw 16-9s-9e	40	1797

Indiana

Company, Well and Location	Init. Prod. Bbls.	Depth
Decatur County—		
Hossier Public Utility, Schoettmer 206, c ne ne 14-9n-9e	¶0.140	929
Gibson County—		
Horton & Wiggins, State Life Inc. 1, swc nw 14-1s-12w	*	2400
Amis, Dunn 1, nw nwc ne 19-3s-13w	*	2145
Crosbie et al, Keck 2, nw se ne 34-3s-14w	150	2810
Bander et al, Cooper 28, se sec 13-3s-14w	144	2524
Lewis Prod., Cooper 7, nw se nw 13-3s-14w	1000	2873
Hollandsworth Bros. et al, Cooper 3, nw ne se ne	100	2100
Bander et al, Cooper 26, sw se ne ne 24-3s-14w	150	2562
Hollandsworth Bros. et al, Cooper 4, ne ne se ne 24-3s-14w	100	2110
Keck 2, ne se ne nw 34-3s-14w	110	2815
Sandler, Keck 1, 165 ft n of nec nw	107	2801
Marion County—		
Jefferson, Indianapolis Water Co. 1, ne ne csw 15-16n-3e	12	892
Indianapolis Water Co. 2, 60 ft s of c s ½ s ½	¶.050	950
Pike County—		
Shirley, Roberts & Kell 1, ne se nw ne 7-1s-9w	*	1000
Spencer County—		
Damron et al, Smith 1, c nl sw ne 19-7s-6w	*	1320

Kansas

Company, Well and Location	Init. Prod. Bbls.	Depth
Barton County—		
Ash et al, Montgomery 1, 11-16w-11w	*	3422
Stanolind, Rose 6, cwl nw ne ne 3-20-11w	204	3311
Magnolia, Roetzel 18, c e½ ne se 24-20-11w	2416	3285
Butler County—		
Allve, Porter "B" 56, ne se ne nw 1-26-4e	30	2425
Ellis County—		
Virginia et al, Craig 1, c e½ se se 8-11-16w	*	3470
Shell, Rumsey 28, nw ne sw ne 23-11-17w	3000	3422
Phillips, Peavey 3, c n½ ne se 13-11-18w	3000	3332
Hollow, Thomas 1, c s½ se se 3-12-18w	621	3658
Greenwood County—		
Rhodes, Bays 1, ne nw se 17-23-13e	20	1782
Marilyn, Burke 1, nec sw 27-24-11e	*	50
Harvey County—		
Gulf, Redenbaugh 1, sw nw sw 17-23-3w	89	3376
Hipple, Martindell 3, nec se 18-23-3w	78	3357
Marion County—		
Troxwell et al, Rezmicek 1, se nw nw 22-17-4e	35	2464
McPherson County—		
Sunray, Anderson 1, c w½ sw nw 17-20-5w	*	3875
Rice County—		
Derby, Lewis 4, nw sw sw 7-18-7w	44	3233
Myers et al, Strong 1, sw ne ne 4-18-8w	1637	3257
McPherson Drlg. Co., Cramm "A" 4, nwc 15-19-9w	3000	3209
Gulf, Wickerham 1, sw se se 7-20-9w (salt water disposal)		3839
Garden et al, Hauschild 2, csl se ne se 15-21-7w	786	3391
Rooks County—		
Trickett et al, Daugherty 1, c w½ nw ne 13-9-17w	298	3252
Russell County—		
Davis, Gaynor 1A, 40 ft n sec nw 19-13-14w (otd 2944 ft)	5	2930
Shields, Regg 3, c n½ sw sw 28-14-13w	595	2918
Wakefield, Milberger 1, sec nw 7-14-14w	*	3333
Aylward, Holl 7, sw nw sw 22-14-14w	3046	3084
Stanolind, Krug "A" 4, c e½ nw ne 27-14-14w	1808	3042
Krug "A" 7, csl sw nw ne 27-14-14w	2467	3043
Central, Kouback "A" 1, c s½ nw ne 15-14-15w	1370	3276
Cities Service, Padazus 4, cwl sw se sw 25-15-14w	520	3327
Stafford County—		
Stanolind, Hitz 2, c w½ se nw 2-22-12w	3000	3571
Martin 7, c e½ nw nw 14-24-11w	3000	3832

Kentucky

Company, Well and Location	Init. Prod. Bbls.	Depth
Breckenridge County—		
Eureka Oil & Gas, Davidson 2	15	303
Daviess County—		
Baldwin Oil Co., Hansford 1	165	1526
Cane Run Pet., Jackson 12	5	671
Miller, Morgan 7	50	1408
Master Oil, Richmond 2	*	1851
Baldwin Co., Westerfield 3	50	1179
Hancock County—		
Fletcher et al, Sanders 2	¶.150	486
McLean County—		
Snowden & McSweeney, Butterfield 8	15	1695
Ohio County—		
Ashby, Combs 1	*	850
Libee, Coy 1	*	729
Vickers & White, Howard 2	25	594
Shaw, Muffett 3	3	529

South Louisiana

Company, Well and Location	Init. Prod. Bbls.	Depth
Bancroft—		
Republic, Columbia Land & Timber Co. 12	192	7323
C. Franks 1	144	7327
Chalkley—		
Shell, Hanszen 5	1022	8949
Creole—		
Superior State 9	48	8350
Eola—		
Amerada, Marchive 9	650	8560
Garden Island—		
Texas Co., State 38	259	4920
Golden Meadows—		
Berkshire Oil Co., Nicol 8	390	5182
Nicol 13	250	2690
Peter Cioban, Alario 1	30	2669
Jim McMurrey, Collins 1	187	5179
Texas Co., L. L. E. Golden Meadows 4	185	5370
L. L. E. Golden Meadows 6	193	5178
State Catfish Lake 5	125	2720
Grand Lake—		
Amerada, State 2	¶¾	8350
Jennings—		
Shell, Conover Community 8	776	7400
Lake Long—		
Fohs Oil Co., State 11	160	9078
Lake Pelto—		
Texas Co., State 28	324	5460
New Iberia—		
Wm. Helis, Schwing 8	20	892
Lisbon-Iberia, Gulf Fee 8	400	3660
North Crowley—		
Humble, Thevis 2	803	8782
Perkins—		
Humble, Edgewood 3	*	7386
Quarantine Bay—		
Gulf, State QQ 14	528	8198
South Houma—		
Shell, Peters 4	*	11,344
Valentine—		
Pan American, Community A-3	*	11,001
West Hackberry—		
Stanolind, Gulf Land 30	*	7501
Woodlawn—		
Union Sulphur, Norton 1	261	9310
East Baton Rouge Parish—		
B. H. J. Balter, Balter-Ratcliff 1, Zachary area, 45-4s-1e	*	6516
Iberville Parish—		
Humble, Wilberts Sons 1-B, Bayou Des Glaize area, 78-8s-8e	*	4182

North Louisiana

Company, Well and Location	Init. Prod. Bbls.	Depth
Bossier Parish (Sligo)—		
Union Prod. Co., S. L. Herold A-1, 29-17n-11w	¶30	5335
Claiborne Parish (Lisbon)—		
Tiki Expl. Co. & Oakes, Lloyd 1, 10-20n-5w	300	5329
Webster Parish (Cotton Valley)—		
Hassie Hunt, Holloway-Davis 1, 23-21n-10w	165	5962

Michigan

Company, Well and Location	Init. Prod. Bbls.	Depth
Allegan County—		
Huffman Drilling Co., Hillman 1, se se ne 2-1n-14w	*	1367
Blood-Hendershot, Knox 2, ne sw nw 4-2n-16w	*	1315
Twin Drilling Co., Plasman 1, se sw sw 24-4n-16w	*	1470
W. S. Cook, Costen 1, se ne nw 34-4n-14w	800	1466
Voorhees Oil Co., Schumaker 3, se nw nw 12-4n-13w	40	1613
Arenac County—		
W. E. Ross, Buffalo Land 1, sw nw nw 10-20n-4e	¶5	1140
Clare County—		
McClanahan Oil Co., State 1, c s ne ne 29-19n-6w	50	3840
C. L. Maguire, Inc., Russell 1, c s sw ne 29-19n-6w	35	3848
American Drilling Co., Newcomer 8, n se ne 32-19n-6w	780	3894
Gratiot County—		
Land & Lewis, Forquer 1, c se 32-11n-4w	¶5½	968
Isabella County—		
J. V. Wicklund Co., Haley 1, nw sw nw 16-16n-3w	75	3713
Kent County—		
Crown Dev. Co., Rogers 1, c s se ne 14-6n-12w	25	1894
Smith Pet. Co., Englesma B-1, se sw nw 32-7n-12w	50	1837
Eastern Pet. Co., Taalman 2, se nw sw 28-7n-12w	1400	1898
Fisher & McCall, Bultema 2, ne ne nw 29-7n-12w	250	1898
Newhouse 4, sw ne nw 29-7n-12w	120	1898
Swanson Oil Co., Slykhouse 6, nw sw se 32-7n-12w	100	1914
J. E. Flanigan, Slykhouse 1, c sw nw 33-7n-12w	750	1910
Welsho Oil Co., Bond 1, nw ne se 23-6n-12w	25	1890
Montcalm County—		
E. C. Dailey, Johnson 1, sw se ne 13-12n-6w	¶½	1294
Osceola County—		
Champion Dev. Co., Ealy 1, nw nw ne 30-20n-8w	*	2030
Mich. Devonian, Reedy 1, c n se nw 4-18n-7w	*	1858
Ottawa County—		
Molloy & Ray, Potter 1, c s sw sw 16-5n-15w	*	1594
Basin Oil Co., Connell 3, se sw se 24-7n-13w	85	1935
C. C. Goff, Sims 1, ne se nw 24-7n-13w	35	1930
Borough, Inc., Brady 3, se nw ne 25-7n-13w	150	1885
Saginaw County—		
Robert Bond, Sweeney 1, nw se ne 1-11n-1e	*	3330
Van Buren County—		
Welsh Oil Co., Minshall 1, se sw nw 21-2s-16w	*	1007
Miller Bros., Foster 1, se se nw 11-1s-15w	*	1208
J. F. McGovern, Niles 1, sw nw sw 24-1s-15w	*	518
W. H. Bochenck, Fee 1, ne se sw 3-2s-17w	*	1090

Mississippi

Company, Well and Location	Init. Prod. Bbls.	Depth
Hinds County (Wildcat)—		
Byrd-Frost et al, Gaddis 1, 12-6n-3w	*	6342
Rankin County (Jackson)—		
Willmut G&O Co., Boehle 1, 18-5n-2e	¶25	2465
Yazoo County (Wildcat)—		
Conroe-Wilcox Oil Co., Stubblefield 1, 25-12n-1w	*	5015
Yazoo County (Tinsley Dome)—		
Union Prod. Co., Woodruff 3, 13-10n-3w	525	4596

New Mexico

Company, Well and Location	Init. Prod. Bbls.	Depth
Eddy County—		
R. W. Fair et al, Watson-Smith 1, sec 4-18s-29e	2640	2550
Nash-Windfohr & Brown, Jackson 1-B, near nec nw 24-17-30	1296	3460
Eddy County (Wildcat)—		
Wills et al, Keyes-Conoco 1, sec nw 15-20s-30e	168	1587
Lea County (Halfway)—		
Argo Oil Corp., Humphries 1, nec se 17-20s-32e	*	2692
Lea County (Hardy)—		
Gulf, Mattern 4-B, sec 30-21s-37e	149	3800
Two States Oil Co., Marshall-Ohio 1, c sw sw 27-21s-37e	96	3758

United States Well Completions—*Continued*

Company, Well and Location	Init. Prod. Bbls.	Depth
Lea County (Lovington)—		
Stanolind, State 3-E, c nw nw 1-17s-36e	112	4970
Lea County (Maljamar)—		
Maljamar O&G Corp., Mitchell 3-B, c nw se 20-17s-32e	217	3725
Lea County (Rhodes)—		
Stanolind, Farnsworth 2-C, ne sw ne 4-26s-37e	¶14	2900
Lea County (Skelly)—		
Skelly, Sims 6, c ne sw 34-22s-37e	275	3645
Lea County (Vacuum)—		
Phillips, State-Santa Fe 35, c se sw 33-17s-35e	552	4623
McKinley County—		
Forth et al, fee 5, 29-20n-9w	*	690
Guarantee Oil Co., fee 1, 31-20n-9w	*	327
Morrow et al, Comanche 1, 29-20n-10w	*	885

New York

Allegany County—		
N. V. V. Franchot, Reddy farm, Alma	9	1490
Bradley Prod. Corp., Monitor farm, Alma	7	1372
Monitor farm, Alma	8	1410
George Oil Co., Scott farm, Alma	6	1427
McEnroe & Brown, Kemp farm, Alma	9	1276
Kemp farm, Alma	7	1264
O. D. Underwood et al, McDivitt farm, Bolivar	6	1270
Marsh Oil Co., Withey farm, Bolivar	9	1370
Mack Oil Co., McDermott farm, Bolivar	11	1335
Nichols & Crowley, Wellman farm, Bolivar	7	1426
E. J. Phillips et al, Phillips farm, Bolivar	6	1440
L. H. Thornton, Agt., Cornwell farm, Willing	5	1229
Brown farm, Alma	40	1372
Water (Intake) Wells		
George Oil Co., Scott farm, Alma	..	1454
Summit Oil Co., Witter farm, Scio	..	1275
L. E. Norton, Coats farm, Scio	..	1260
Quaker Oil Co., Louisa Brown farm, Alma	..	1186
Louisa Brown farm, Alma	..	1169
Cousin Oil Co., August Brandes farm, Wellsville	..	1345
August Brandes farm, Wellsville	..	1363
August Brandes farm, Wellsville	..	1352
Floyd Oil Co., Fanton farm, Wellsville	..	1266

Oklahoma

Caddo County—		
Ohio, Pau-Kune 12, nw nw sw se 3-5n-9w	5070	3439
Canadian County—		
Ramsey, Mansfield 1, c nw ne 16-14n-9w	*	9611
Carter County—		
Dillingham, Harrell 1-A, ne nwc ne 22-2s-2w (otd 833 ft)	18	1148
Comanche County—		
Evans, Maloney 3, c se se 23-2n-11w	*	150
Carter, Johnson 1, ne ne se sw 26-2n-11w	5	228
Johnson 2, ne se sw 26-2n-11w	3	250
Creek County—		
Big Four Petroleum, Vance 4, sw ne ne 24-19n-7e	27	2725
Bryan, McClain "A" 1, sw nw nw 22-19n-9e	*	2791
Grady County—		
Magnolia, Harrison 1, ne ne se ne 28-3n-5w	85	2521
Haskell County—		
Utilities, Ralston 2, c se nw 27-8n-20e	¶1/5	648
Hughes County—		
Corbett, Kizer 1, se sw se ne 35-8n-8e	*	1205
Kingfisher County—		
Anderson-Prichard, Geis 1, c ne sw 15-18n-9w	¶3	7365
Kiowa County—		
Hagerling, Bozman 1, sec ne 14-5n-18w	*	582
B. & M. Drlg. Co., Burnett 1, se sw ne ne 30-7n-20w	*	1015
Lincoln County—		
Morgan-Gulf et al, Rubas 1, c n½ nw nw 2-12n-5e	620	4237
Wilcox, School Land "A" 2, sec sw 16-14n-6e	85	3110
Muskogee County—		
Potter et al, White 1, sw sw se sw 3-14n-16e	*	1855
Okfuskee County—		
Summit, Stell 3, se ne nw sw 18-10n-11e	244	2183
Stekoll, Autry 1, nec 35-10n-11e	*	2135
O'Laughlin, Keys 2, c n½ ne sw 11-11n-8e (otd 3969 ft)	18	4002
Okmulgee County—		
Wallace, Colbert 14, sw ne sw ne 14-14n-14e	10	1085
Price et al, Grayson 6-A, se sw nw ne 21-14n-14e	*	1760
Osage County—		
Johnson O&R Co., 4, nw nw se ne 10-21n-8e	*	2760
Pawnee County—		
West, Sewell 1-A, sec 32-21n-8e	*	1490
Pottawatomie County—		
Iglehart et al, Richards 1, nec nw 8-6n-5e	*	4140
Magnolia, Brister 3, nw nw sw ne 28-7n-4e	589	4296
Phillaine, Garrett 4, ne sw nw 28-7n-4e	516	4337
Sinclair Prairie, Deatherage 2, nec nw 28-7n-4e (otd 4132 ft)	2488	4278
Magnolia, Tull-Fyke "B" 3, se ne se 20-7n-5e	150	2817
Delaney, Brune 3, nec se 31-7n-5e (otd 4103 ft)	340	4141
Smith, Tarter 6, nwc sw 32-7n-5e (otd 4109 ft)	135	4175
Harper et al, Robinett 1, se ne nw 2-9n-4e	*	4566
Dunnett, McDaniel 3, ne sw se 31-11n-4e	448	4472
Seminole County—		
Simpson-Roodhouse, Stewart 2, nw sw sw	42	1889
Stanolind et al, Reed 1-A, swc ne 6-6n-8e	*	4259
Gulf, Payne 10, sec 18-9n-6e (otd 4235 ft)	18	4280
Hall-Troup et al, Harber 1, nec nw 6-9n-7e	*	3825
Stephens County—		
Carter et al, Parker 1, se se ne ne 16-1s-5w	¶6.8	745
Johnson et al, Baker 1, c se nw 35-2s-6w	*	2021
Pace et al, Montgomery "C" 2, ne sw nw se 11-2s-8w	*	2022
Tillman County—		
Magnolia, Amyx 1, nw sw se 17-3s-16w	*	5812
Tulsa County—		
Culbertson et al, Bre-Dahl 1, nw nec se 28-19n-2e	7	583
Wagoner County—		
Hopper, Vernon 1, sw sw nw se 23-18n-16e	*	455

Pennsylvania

Bradford District (Water Intake Wells)		
Forest Oil Corporation, 2 wells	..	....
Forest Petroleum Corp., 2 wells	..	....
Niagara Oil Corporation, 6 wells	..	....
Bradford District (Regular Completions)		
Mathew Lippert et al, Lippert	15	....
George Smith Estate, Fee	1	....
Messer Oil Corp., Redfield	3	....
Forest Oil Corp., 2 wells	2	....
Forest Petroleum Corp., 2 wells	2	....
Niagara Oil Corp., 2 wells	2	....
D. W. Daly, No. 2, Bing 369	2	....
H. M. Jack et al, Jack	2	....
Hillside Oil Co., Covert	2	....
Bradford Transit Co., 9 wells	9	....
Middle District		
Richard F. Krear, John Lusher	1	....
Sweetapple Russel et al, Mrs. C. Russell	1	....
Butler-Armstrong District		
Dr. Walters et al, J. H. Flick Heirs	1	....
South Penn Oil Co., Fowler & Campbell	*	....

Texas Panhandle

Carson County—		
Magnolia, fee (acct. 244) 68	496	3085
Gray County—		
Skelly, Schafer 102	331	3302
Stanolind, Cobb 7-A	144	3332
Hutchinson County—		
Pennotex Oil Corp., Thompson 3	441	3000
Stanolind, H. B. Terry 22	173	3003
W. B. Haile 14-A	326	3098
W. B. Haile 16-B	201	3051
Ware 16-B	215	3135
Wheeler County—		
Columbia Fuel Co., Plummer 4	136	2448

West Central Texas

Jones County—		
Sandy Ridge Oil Corp., Alton-Magnolia 2	400	1901

West Texas

Andrews County (Means)—		
Humble, J. S. Means 72	1083	4506
Cochran County (Duggan)—		
Skelly, Tarver 1	367	5050
Crane County (Sand Hills)—		
Humble et al, Tubb 33	2604	4400
Crockett County (Wildcat)—		
Kimberlin et al, Robbins-Superior 1	*	1880
Ector County (Foster)—		
Stanolind, E. F. Cowden 32-A	67	4160
E. F. Cowden 34-B	1438	4200
E. F. Cowden 35-B	837	4210
Ector County (Goldsmith)—		
Gulf, Goldsmith 237	726	4194
Trinity Drl. Co., Scharbauer-Humble 2	979	4200
Ector County (Jordan)—		
Sinclair Prairie, University 6-79	561	3650
Ector County (North Cowden)—		
Shell, E. N. Woods 1	1205	4470
Sinclair Prairie, Holt 4	634	4272
Tidewater Associated, Smith-Collins 1-B	815	4260
Gaines County (Seminole)—		
Osage Drl. Co., Tippett-Ohio 4-A	627	5336
Gaines County (Wasson)—		
Amon Carter et al, Moore 4-A	618	5026
Wasson 6-E	938	5053
Phillips et al, Wasson-Loffland 3	50	4995
Hockley County (Slaughter)—		
Western States Gasoline Corp., Coons-Humble 3	1184	5001
Howard County—		
Shasta Oil Co., Texas L&M Co. 13	1389	2789
Pecos County (Lehn)—		
Rockdale Oil Co., Sullivan 2	126	1735
Pecos County (Shearer)—		
Street et al, Shearer-Texaco 12	398	1484
Pecos County (Taylor-Link)—		
Breeding et al, University-Humble 4-J	48	1757
Pecos County (Wildcat)—		
Phillips, Byrne 1	†	400
Scurry County (Sharon)—		
Blue Streak Oil Co., 1st. Nat'l Bank 1	251	2540
Winkler County (Hendrick)—		
Bates-Reading Oil Corp., Cowden-Shell 2-C	245	2990
Winkler County (Halley)—		
Skelly, Halley 35	2178	2820
Winkler County (Keystone)—		
Weiner et al, Jenkins-Conoco 1-a	248	3400
Yoakum County (Wasson)—		
Aloco Oil Co., Greer-Texaco 3	1016	5203
Willard-Texaco 3-B	659	5218
Gulf, Elliott 4	99	5200
Honolulu Oil Corp., Wilder 4-804	817	5165
Humble, Wooten 22	907	5120
Mabee et al, Willard 13	1320	5185
Willard 15	1185	5200
Magnolia, Kendrick 5-867	1512	5110
Oil Dev. Co., Willard 4-801	2046	5215
Willard 8-803	1946	5215
Osage Drl. Co., Claywater-Amerada 1	1168	5225
Lynn-Shell 3	522	5200
Sinclair Prairie, Kendrick 6-A	485	5148
T. P. Coal & Oil Co., Bennett 26	1073	5245
Tidewater Associated, Campbell-Posey 2	162	5060

South Texas

SAN ANTONIO DISTRICT

Frio County—		
Pagenkopf and Jamieson, Houston Estate 2 (WC) (Frio Town)	*	3000
Medina County—		
Tapp, Bendele 1 (WC), 7 miles sw of Hondo	*	235
Milam County—		
Krause, Graves 1 (WC), 8 miles s of Buckholts	*	1525

CORPUS CHRISTI DISTRICT

Bee County—		
Anderson-Prichard & Bennett, Robinson 1 (WC), (West Tuleta)	¶3 & 18	7921
Humble, Caswell 1 (WC), 7 mile nw of Pettus	*	2809
Brooks County —		
Humble, McGill 39 (Kelsey)	350	4732
McGill 40 (Kelsey)	400	4733
Cameron County—		
Sal Vieja & Pure, Newberry 3 (WC), 7 miles sw of Port Isabel	*	8168
Jackson County—		
Magnolia, West 21-A (West Ranch)	200	5563
West 34-A (West Ranch)	500	5124
West 36-A (West Ranch)	1000	5570
Jim Wells County—		
Crosby, Adams 1 (Alfred)	*	4705
Howell & Hubble, Schiehle 1 (Premont)	198	2355

(Continued on Next Page)

United States Well Completions—*Continued*

Company, Well and Location	Init Prod. Bbls.	Depth
Karnes County—		
Gar, Barnett 1 (WC), 5 miles ne of Karnes City	*	2519
Live Oak County—		
Clements, Clements Estate 1 (WC), 4 miles s of Whitsett	*	1140
Simmons, Reagan Estate B-8 (Oakville)	*	2837
Refugio County—		
Coronado, Rooke 34 (La Rosa)	600	5928
San Patricio County—		
Bay-Tex, Sigmund 1 (McCampbell)	350	7189
Easterwood, Cryer 4 (Plymouth)	50	5665
Houston, Baldwin 6-A (East White Point)	500	5663
Southern Minerals, King 1 (McCampbell)	325	7170
LAREDO DISTRICT		
Duval County—		
Blanchard, Parr 2 (Muralla)	*	4608
Continental, Driscoll A-43 (Driscoll)	398	3377
Hiawatha, Denman 5 (Longhorn)	*	6011
Porter, Garcia 1 (WC), 2 miles sw of Chiltipin field	*	4923
Sun, Brueggemann 22, (Fitzsimmons)	500	4306
Hidalgo County—		
Phillips, Sullivan 1 (Samfordyce)	*	3614
McMullen County—		
Davis, NL&L 1 (Munson) (Nueces Land & Livestock Co.)	25	1194
McBride, NL&LC (WC), 1 mile n of Munson field, 7½ miles sw of Loma Alta	*	1829
Starr County—		
Carrie, Ramirez 1 (WC), share 227, Porcion No. 69	†	289
Clopton & Mitchell, Seabury 1 (WC), 3 miles nw of Rio Grande City (Seabury)	25	2757
Gilbert, Escobar 1 (WC), (Pistol Hill) 8½ miles n of Roma	*	848
Webb County—		
Arkansas, Adami A-2 (Adami)	51	986
Baker, Watkins 1 (WC), 1650 ft w of Boysen & Jones 5-A	*	700
Hynes, Bruni 3, 4½ miles east line and 3 miles south line of county	*	2850
Lern, Spain 1 (WC), 1 mile n of Carolina-Texas field, 8 miles n of Oilton	*	2314
McBride, Laurel Brothers 1 (WC), ½mile n of Hosser (North Killam)	*	2717
Poe, Adami 3 (Adami)	30	988
Zapata County—		
Murray & Martinez, Bruni 1 (WC), 5 miles nw of Mirando Valley field	*	921

East Texas

Joiner Area—		
Hunt Oil Co., Bradford 26-D (176.3-ac)	240	3632
McMurrey et al, Roberson 16 (145.8-ac)	1500	3808
Kilgore Area—		
Shell, W. P. Moore 22 (140-ac)	4500	3751
Sinclair Prairie, King 61-B (337.6-ac)	3600	3531
Franklin County (Talco)—		
Texas Co., Barker 9 (468.39-ac)	390	4280
Freestone County (Wildcat)—		
A. G. W. Biddle et al, Nettles 1	*	4140
Houston County (Grapeland)—		
Cook et al, Masters-Shell 1	¶30	6062
Houston County (Navarro Crossing)—		
Cook et al, Perrone-Shell 1	*	5916
Humble, Dailey 4 (1002-ac)	135	5854

North Texas

Archer County (Hull-Silk)—		
Blackwell O&G Co., Wilson-Christie 4-C	1936	4325
Continental, Wilson-McCrory 5	1488	4355
Ligon et al, Little 2-B	856	4365
Peterson & McCarty, Wilson-Hall 31-B	1200	4340
Pet. Producers Co., Johnson 1-B, sec 2	1040	4343
L. Sikes et al, Anderson 5	600	4042
Thurmond-Lipscomb et al, Wilson 4	210	4350
Archer County (K-M-A)—		
Sinclair Prairie, Kempner 1, blk 42	62	3890
Archer County—		
Griffin et al, Waggoner 5-B, sec 3	*	1658
Hamilton Pet. Co., Green 2-B	88	1133
Green 4-B	158	1140
Johnson et al, Brown 1, sec 2421	*	1421
King Oil Co., Rogers 9, sec 1600	10	1278
Pace Pet. Co., Abercrombie 26-B, blk 156	10	1020
G. J. Scholl et al, R. D. Andrews 1, sec 1806	*	963
Shappell Oil Co., Carter 5, sec 39	*	1196
Jackson 5-D, blk 5	60	682
Shell, Colgin 5	58	1455
Southern Pet. Explo. Co., Johnson 6, sec 1	*	1327
Wo-Mac Oil Co., Harmonson 1	*	902
Baylor County (Seymour)—		
British-American O. P. Co., Green 5-D, sec 215	570	2558
Clay County—		
Costley et al, Taylor 2-C, blk 41	*	1288
Metzner et al, Taylor-Metzner 4, sec 23	321	1155
Taylor-Metzner 5, sec 23	335	1187
Taylor-Metzner 7, sec 23	*	1204
Clay County (Wildcat)—		
Manley et al, Klein 1	*	1271
Cooke County—		
Clark & McKee, Walterscheid 1, blk 12	*	810
McDaniel & Beecherl, Weisman 7, blk 2	10	781
Roberts et al, Trubenbach 1, lot 3	9	1855
Wham et al, Voth 2	*	1792
Cooke County (Walnut Bend)—		
Sinclair Prairie, McGeorge 4	541	4963
Cox & Hamon, K. Neu-Texaco 4-A	520	4983
K. Neu-Texaco 9-B	688	4915
Fannin County (Wildcat)—		
H. W. English et al, T. W. Ayers 1	*	815
Jack County—		
Burtner & Fleeger, G. E. Winn 1	30	3292
Page et al, M. E. Edwards 1	*	339
Paul et al, Craig 1	*	312
Montague County (Nocona)—		
Stanolind, K. Davis 2	1920	5255
Montague County (Bonita)—		
United Prod. Co.-Continental, Rich 1	48	3740
Montague County (Wildcat)—		
Grimes-Feagin-Youngblood & Foree, Admire 1	*	4520
Wichita County (K-M-A)—		
Bridwell Oil Co., F. L. Cone 1	*	4404
E. C. Oil Co., Mangold 20, blk 33	712	3857
Shell-Phillips Pet., Griffin 6	900	3814
Texas Co., F. Thom 2	896	3845
Tide Water Associated-Perkins-Cullum, Ferguson 14	1120	3833
Wichita County—		
Bolin & Morganstern, Waggoner Est. 26, sec 148	20	1744
Van Wormer et al, Cochran 3-A, sec 9	46	758
Wilbarger County (Consolidated)—		
Consolidated Oil Co. et al, Waggoner Est. 6-CC	1224	3823
Woods et al, Womack 3	752	3772
Wilbarger County—		
Lawson & Leavell, Waggoner Est. 2-U, sec 109	202	1330
Pois & Schulz, A. Streit 1, sec 19	15	1740
A. Streit 2, sec 19	75	2016
Tom B. Medders et al, Waggoner Est. 6	760	3078
Wilbarger County (Wildcat)—		
Consolidated Oil Co. et al, Waggoner 1-EE	*	1854
Young County—		
Caddo Oil Corp.-J. McLester, Long 1-a	559	3796
Gilmore et al, Watson 2, blk 22	*	621
Long et al, G. A. Bills 1-B, sec 1970	1040	3960
King-Wooten 2-C	*	240
Wooten & Wilson, Howard 1, sec 1480	*	977

Texas Gulf Coast

Anahuac—		
Gulf, Blancke C-2	565	7140
Humble, Middleton 45	637	7235
Barbers Hill—		
Texas Gulf, Kirby Pet. Co. B-30	341	3456
Cedar Point—		
Standard of Texas, State 61-120	*	6400
Clam Lake—		
Shell, McFadden 8	132	6035
Clear Lake—		
Humble, Humble-West Fee C-27	120	5912
Cotton Lake—		
Salt Dome, Lawrence F-1	88	6527
Friendswood—		
Humble, West Prod. Co. 21	504	6042
Hastings—		
Stanolind, Curkeet 37-C	399	6099
Sneed 18	618	5996
Sneed 19	630	6080
Humble—		
Texas Co., Carroll Oil 34	297	2928
South China—		
J. H. Blaffer, Williams 1	66	7724
Stanolind, Steinhagen A-5	190	7790
Markham—		
Hamil & Hamil, Sisk H-5	*	3729
Old Ocean—		
Sun, Campbell 3	354	10,510
Pickett Ridge—		
J. B. Ferguson, Pierce Estate 4	85	4699
Texas Co., Nilson 1	254	4705
Segno—		
Gulf, Wing 25	368	8110
Jordan Dr. Co., Hughes 1	132	8107
Spanish Camp—		
Houston Oil, Hinze 1	¶1	3013
Thompson—		
H. M. Naylor, Hampil 2	921	7934
Musselman 8	*	8464
Quintana Pet. Co., Wolters B-1	128	5410
Brazoria County—		
Frazier & Mayo, State 1, Sandy Point area, A. McFarland sur.	*	9151
Montgomery County—		
T. J. Wood et al, Fultz 1, East Montgomery area, Wm. C. Clark sur	*	5034
Tyler County—		
J. Z. Werby, Hayes 1, n of Colmesniel, J. C. Boyette sur.	*	4530
Wharton County—		
Bennett & Campbell, Harrison & Mitchell 1, Lissie area, G.H.&H. No. 21	*	7120

West Virginia

Calhoun County—		
Stewart, Frands 3	¶.30	2159
Carnegie Natural Gas Co., Swisher 1	¶.25	2058
Gilmer County—		
Gilco Oil & Gas Co., Patton 3	5	2413
Pleasants County—		
Columbian Carbon Co., Ervin-Hammett 1	3	2930
Ritchie County—		
Bickel, Smith 2	¶.08	1865
Roane County—		
Reed et al, Litton 3	30	1685
Harper Oil Co., Eagle 1	10	1609
Wayne County—		
Petry, Taylor 1	¶.20	3044
Wood County—		
Wotoga Oil Co., Leonhart 7	5	1609

Ohio

Athens County—		
Gross & McCune, Antle 5	5	471
Cuyahoga County—		
Benedum-Trees, Dawson 1	¶.38	2920
Guernsey County—		
Purdy Co., Morgan 1	¶.15	967
Lorain County—		
W. M. Dempsey, Howeth 1	5	2545
Dunham 1	2	261
Medina County—		
Marine Trust Co., Ripley A-12	5	474
Ross O-29	I	267
Ross O-35	I	349
Perry County—		
Preston Oil Co., Griffith 2	¶.50	3243

"I" indicates water input well.
*Failures; †Junked; ¶Million cu. ft. gas.

Illinois permit office located at Troy

Springfield, Ill.—Beginning January 1, applications for permits to drill oil or gas wells in Illinois are to be mailed to T. Alvin Scully, civil engineer in the state department of mines and minerals at Troy, Illinois, department officials announced here last week. Since the permit law became effective last summer, applications have been sent direct to the department in Springfield.

The change will not apply to applications for core holes, which the department has been holding confidential at the request of operators, or for requests of information on structural and geological matters. These matters will continue to be handled from Springfield.

Proposed refinery at Buffalo would take Illinois crude

An additional outlet for Illinois crude was indicated with announcement last week that the Hambleton Terminal Corporation will construct a 5000-barrel refinery at Buffalo, New York, at an estimated cost of $1,400,000.

WILDCAT REPORT
New Starts and Completions

ARKANSAS
COMPLETION

Columbia County—Standard Oil Co., Petty Stave Co. 1, se se 4-17-21, elev 263 ft, top Nacatoch 1790 ft, anhydrite 3482-3641 ft, top Smackover lime 7943 ft, 168 bbls distillate, 4 mil ft gas, td 7999 ft (Smackover lime).

CALIFORNIA
FIRST REPORT

Los Angeles County—Continental Oil Co.'s Howell 1, 11,679 ft s 8644 ft e swc 2-2-16, San Fernando area, grade.

KANSAS
FIRST REPORTS

Butler County—National Refg. Co.'s Lankford 1, sec ne 23-27-5e, dr.

Cowley County — Crown Petroleum Co.'s Dunn 1, nwc se 19-34-5e, lcn.

Gove County—Cities Service Oil Co.'s Victory Life 1, cwl nw 36-13-30w, rur.

Russell County—Wakefield et al's Schmidtberger 1, cnl ne sw 17-13-15w, dr.

COMPLETIONS

Barton County—Day et al's Feltes 1, sec ne 14-16-12w, Coal Creek pool, top Arbuckle 3342 ft, td 3348½ ft, 375 bbls, 42 gr.

Butler County—Shawver's Fee 1, sec nw 26-29-4e, 2 mi ne North Rock pool, top Kansas City 2260 ft, top Mississippi 2870 ft, top Arbuckle 3328 ft, abnd 3340 ft.

Cowley County—Mitchell Drilling Co. et al's Ireton 1, c e½ se ne 7-31-4e, s Clark pool, top Topeka 1245 ft, top Lansing 1913 ft, top Stalnaker 1919 ft, top Kansas City 2314 ft, top Mississippi 2914 ft, top Arbuckle 3298 ft, abnd 3304 ft. Earl Wakefield's Steel 1, c e½ sw se 6-32-6e, 1 mi s Burden pool, top Kansas City 2470 ft, top Mississippi 3113 ft, abnd 3114 ft.

McPherson County—Palmer et al's Williams 1, c el se ne 32-19-5w, top Mississippi 3438 ft, top Viola 3867 ft, abnd 3874 ft.

Stafford County—Seaney et al,'s Brown 1, swc se 1-21-13w, 4 mi n Gates pool, top Lansing 3243 ft, top Simpson 3492 ft, top Arbuckle 3509 ft, abnd 3591 ft.

SOUTH LOUISIANA
FIRST REPORT

Jefferson Davis Parish—Continental's Nibletts Farms 1, Nibletts Farms area, center of se¼ ne¼ of sec 1-11s-5w, roads.

COMPLETIONS

Beauregard Parish—California Co.'s Long Bell Lbr. Co. 2, 960 ft fr e line and 1795 ft s of n line of sec 12-5s-10w, abnd 10,711 ft.

East Baton Rouge Parish—B. J. Balter's Balter-Ratcliff 1, Zachary area, 274 ft s and 520 ft e of most westerly nwc sec 45-4s-1e, abnd 6515 ft.

Iberville Parish — Humble's Wilberts Sons 1-B, Bayou Des Glaize area, 1750 ft n of s line and 2000 ft e of w line of sec 78-8s-8e, abnd 4182 ft.

MICHIGAN
FIRST REPORTS

Isabella County—Turner Pet. Co.'s Hauck 1, ne nw 24-15n-5w, rig.

Jackson County—Kent Drilling Co.'s Easton 1, se nw se 26-1s-1w, dr.

Mason County—C. K. Dean's Hinckley 1, ne ne 22-17n-15w, rig.

Ottawa County—C. J. Johnson's DeWitt 1, sw nw ne 27-7n-15w, dr.

COMPLETIONS

Allegan County — Huffman Drilling Co.'s Hillman 1, se se ne 2-1n-14w, Traverse 1322 ft, abnd 1367 ft. Blood & Hendershott's Knox 2, ne sw nw 4-2n-16w, Traverse 1291 ft, abnd 1315 ft. Twin Drilling Co.'s Plasman 1, se sw sw 24-4n-16w, Traverse 1461 ft, abnd 1470 ft.

Osceola County — Champion Development Co.'s Ealy 1, nw nw ne 30-20n-8w, abnd 2030 ft. Michigan Devonian's Reedy 1, se nw 4-18n-7w, abnd 1858 ft.

Ottawa County—Molloy and Rau's Potter 1, sw sw 15-5n-15w, Traverse 1575 ft, abnd 1594 ft.

Van Buren County—W. H. Bochenek's Fee 1, ne se sw 3-2s-17w, Traverse 995 ft, abnd 1090 ft.

MISSOURI
FIRST REPORT

Platte County—Bradford et al's Renner 1, nw ne sw 5-50n-33w, dr.

COMPLETIONS

Adair County—McGinnis' Laughlin 1, sec sw 18-62n-15w, s Kirksville, top Mississippi 350 ft, top Hunton 884 ft, top Wilcox 1247 ft, top Arbuckle 1345 ft, abnd 1623 ft. Ettington et al's Clark 1, nw ne se 8-63n-14w, 6 mi ne Kirksville, abnd 200 ft.

Daviess County—Francis' Lewis 1, sw nw sw 28-59n-27w, 2 mi se Gallatin, top Squirrel 410 ft, abnd 770 ft.

Platte County—Missouri Valley Gas & Oil Co.'s Long 1, sec 7-51-33w, top Wayside 414 ft, top Squirrel 549 ft, top upper Bartlesville 670 ft, 200,000 cu. ft. gas 935 ft.

MISSISSIPPI
FIRST REPORTS

Issaquena County—Germany, Lucy & Fair's Mohanna 1, e½ sw 9-18n-3e, bldg road.

COMPLETIONS

Issaquena County—A. A. Chaney's Mohanna 1, c ne 13-18n-3e, abnd.

Hinds County—Byrd-Frost et al's Gaddis Farms 1, se se 12-6n-3w, elev 234 ft, top Eutaw 6337 ft, abnd 6342 ft (Eutaw).

Yazoo County — Conroe-Wilcox Oil Co.'s Stubblefield 1, sec 25-12n-1w, elev 248 ft, top chalk 4727 ft, abnd 5015 ft.

NEBRASKA
FIRST REPORT

Richardson County—Stephens et al's Ogle 1-A, ne nw se se 9-1n-14e, 18 mi e Pawnee City, mi materials.

NEW MEXICO
FIRST REPORTS

Chaves County—T. S. Stanfield et al's Bogle 1, nw nw ne 27-13s-25e, rur.

Eddy County—Jack Harris et al's Josey 1, sec sw 20-20s-23e, lcn.

COMPLETION

Eddy County—Neil H. Wills et al's Keyes-Conoco 1, sec nw 15-20s-30e, elev 3214 ft, base salt 1205 ft, top Yates 1363 ft, lime pay 1586-87 ft, pumped 77 bbls 23-gravity oil 11 hours initial, and hfo after pumping 20 hours.

OKLAHOMA
FIRST REPORTS

Hughes County—Magnolia's Warren 1, ne sw se 35-6n-8e, rur.

Pontotoc County—W. A. Delaney's Massey 1, se nw se 25-4n-6e, dr.

COMPLETIONS

Canadian County—Ramsey's Mansfield 1, c nw ne 16-14n-9w, 3 mi w Calumet, top Layton 6800 ft, abnd 9611 ft.

Hughes County—Senora Oil & Gas Co.'s Warren 1, nwc se 35-6n-8e, s Sasakwa pool, top Gilcrease 3390 ft, abnd 3502 ft.

Kay County—Zephyr Drilling Co.'s High 1, nw ne nw 24-26n-2w, s of Hubbard pool, top Wilcox 4127 ft, abnd 4145 ft.

Tillman County—Magnolia's Amyx 1, nw se se 17-3s-16w, 7 mi se Frederick district, top McLish 5210 ft, top Arbuckle 5653 ft, abnd 5811 ft.

EAST TEXAS
FIRST REPORT

Rusk County—Jeff Bolton et al's Hall Wood 1-a, 1st hole jkd 3225 ft, skid to 150 ft ne Golden Rod Drl. Co.'s Wood 1, J. I. Sanchez sur, 2½ mi nw New Salem, elev 428 ft, cem sur pipe.

COMPLETION

Freestone County—A. G. W. Biddle et al's Ed. Nettles 1, 600 ft from n and 400 ft from w lines of Y. G. Dollahite sur, 7 mi nw Fairfield, elev 413 ft, Pecan chalk 2280-2330 ft, Austin chalk 3073-3386 ft, abnd in Woodbine 4140 ft.

NORTH TEXAS
FIRST REPORTS

Baylor County—Staton & Howard Bunch's Robertson County School Lands 1, 3300 ft from n and 330 ft from e lines Robertson C. S. Lands, 14 mi e Seymour, mim for 3500-ft test.

Cooke County—C. E. Sykes et al's Hill Christian 1, 1000 ft from nw and 1000 ft from sw lines J. P. Bailey sur A-70, lcn for 3000-ft test.

Jack County—W. L. Forbes et al's Davis 1, 2795 ft w and 2065 ft n of m/s/se corner BBB&C Ry. sur A-94, lcn for 2500-ft test.

Montague County—Sinclair Prairie's B. H. Howard 1, 1480 ft from m/s/s line and 420 ft from m/w/w line of 100-acre tr, W. Wal-

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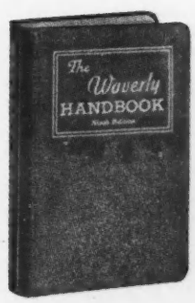

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lace sur A-841, ¾ mi w Bonita, mim for 5000-ft test.

COMPLETIONS

Clay County—Howard Manley et al's Klein 1, 550 ft from n and 5460 ft from w lines Joe Evans sur A-132, 3 mi nw Henrietta, abnd 1271 ft.

Fannin County—H. W. English et al's T. W. Ayers 1, 160 ft from s and 500 ft from e lines w½ J. D. Seales sur, 1 mi nw Trenton, abnd 815 ft.

Wilbarger County—Consolidated Oil Co. et al's W. T. Waggoner 1-EE, se nw se H&TC sec 1, blk 5, abnd 1854 ft.

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WEST TEXAS

FIRST REPORT

Crockett County—Continental Oil Co. et al's Todd Unit 2, c ne sw GC&SF sec 29, blk WX, lcn for Ellenberger test.

COMPLETIONS

Crockett County — Zay Kimberlin et al's Robbins-Superior 1, 2310 ft from n and 1650 ft from w lines GC&SF sec 4, blk B, elev 2580 ft, top anhydrite 437 ft, top salt 480 ft, top Yates 1200 ft, abnd 1880 ft.

Pecos County—Phillips Pet. Co.'s Byrne 1, se se nw H&GN sec 114, blk 11, jkd 400 ft, skid 50 ft north.

TEXAS GULF COAST

FIRST REPORT

Wharton County—J. F. Hutchin's Borden 2, Mackey area, 3818 ft out of the nwc along nw line thence 466 ft at right angles on a 160-ac tract, E. M. Cox sur, lcn.

COMPLETIONS

Brazoria County—Frazier & Mayo's Darrington State Prison Farms 1, Sandy Point area, 1700 ft w and slightly s of Hamman's State 1, McFarland sur, abnd 9151 ft.

Montgomery County—T. J. Wood et al's Fultz 1, East Montgomery area, 330 ft each way out of the nec of Fultz 50-ac tract, Wm. C. Clark sur, abnd 5034 ft.

Tyler County—J. Z. Werby's Hayes 1, n of Colmesniel, 466 ft fr n and w line of 160-ac tract, J. C. Boyette sur, abnd 4530 ft.

Wharton County — Bennett & Campbell's Harrison & Mitchell 1, Lissie area, 466 ft fr ne and se line of 40-ac tract, G.H.&H. No. 21, abnd 7120 ft.

SOUTH TEXAS

FIRST REPORTS

Bexar County — Fred Beatty's George L. Avant 1, 150 ft s line, 450 ft w line of 160 acre lease, survey No. 133, 18 miles sw of San Antonio, moving in. Sanford D. Gardom's F. T. Walsh 1, 577 ft e of Applewhite Rd., 49 ft from s line, 347 ft w of Leon River in 2-acre tract, I. Perez grant, loc.

Caldwell County—J. D. Monk's Williams 1, 330 ft e line, 1600 ft s line 75-ac lease, J. J. Bowman survey, lcn.

Calhoun County — The Coronado Corp.'s Welder 2, 5747 ft ne line, 1401 ft nw line section 3, block e Eusebio Hidalgo grant and in 17,972-ac tract, 3 miles northwest of No. 1, waiting on completion of No. 1 Tex-O-Cal Oil Co.'s J. Brundrett 1, 330 ft ne line, 330 ft nw line tract 8, subd of Brandrett Lands, William Little survey in extreme sw corner of county on Matagorda Island on lot 294, cleaning out to drill deeper from 5021 ft.

Duval County—Alaska-Texas Oil Co. et al's W. R. Peters 1, 330 ft n line, 990 ft e line of se¼ section 791, BS&F survey, 3 miles e of Lopez field, dr 1625 ft. Hiawatha Oil & Gas Co.'s George Herberger A-1, 1399 ft n line, 1399 ft e line of sec 14, Ball Ranch subd, Santos Flores Grant between North Sweden and Sweden fields, rigging up. Landreth Producing Co.'s B. Caballero 1, 1650 ft w line, 330 ft n line of J. Poitevent survey No. 281, 4 miles nw of San Diego, 2½ miles se Thomas Lockhart Pool, lcn. Jack P. Rayzor's P. T. Wright 1, 330 ft from ne line, 330 ft from nw line of the e¼ of sur No. 136, 2½ miles nw of Roseta, lcn.

Gonzales County—H. F. Sears and J. L. Dixon's Martindale Mortgage 1, 150 ft se line, 2200 ft sw line 114.25-ac tr, C. H. Dobie sur, 3 mi ne Slaton, dr 265 ft.

La Salle County—Louis Yeager's Yeager 1, 165 ft n line, 165 ft e line block 4, sur 53, W. H. Wallace subd, 4 mi nw of Adami field, dr 650 ft.

Live Oak County—H. F. Baker's Herring 1, 210 ft n line, 1950 ft e line block 9, Stephen Hays sur, 3 mi s Whitsett, dr 1450 ft.

Nueces County—Nueces Royalty Co.'s Jolley 1, 330 ft se at r/a nw line, 330 ft n of s line of 63-acre tract in nw¼ of sec 29, George H. Paul's subdivision of Driscoll Ranch, 1½ mi w Robstown, lcn. H. J. Porter's A. Chetis 1, 466 ft s line, 466 ft e line, sec 145, Delores Irrigation and Agriculture sur, 3 mi sw Baldwin field, 6 mi n Luby field, lcn. Shield Oil Co.'s Mienholdt 1, 330 ft ne line, 660 ft se line lot 11, G. H. Paul's subd of Robert Driscoll Ranch, set surface casing.

Starr County — Carrie Oil Co.'s Ramierez 1-A, 150 ft e line, 160 ft n line share 227, porcion 69, Jurisdiction of Mier, 10 ft s of No. 1 replacement hole, dr 150 ft. Interstate Minerals Corp.'s Green & Manning 1,, 375 ft n line, 245 ft w line block 7, share 85, porcion 81, 1½ mi w of Ricaby field, junked and abnd by Clopton & Clopton at 377 ft, taken over by Interstate and deepened. Attempted to blow out, set casing preparing to test.

Victoria County—Renwar Oil Corporation and John G. Mayo's G. F. Bayer et al 1, 466 ft nw line, 2178 ft sw line of 121 acre tract in Diego Garcia survey, Ab-39, 7½ miles southeast of Victoria, 3 miles w of Dacosta, rigging up, prepare to spud. Transwestern Oil Company's A. M. McFaddin Estate 1-G, 3120 ft se at r/a from nw line, 3580 ft s line of J. Vairin sur, Ab-123, begin most n'ly se cor of "G" lse and go n along e line 3431 ft, thence w at r/a 4209 ft, 2 miles nw of McFaddin field, dr 6225 ft.

Williamson County—Taylor Refining Co.'s Hurta 1, 3800 ft ne line, 1900 ft sw line Parthinia Coursey sur, 1 mi s of Taylor, dr 1250 ft.

COMPLETIONS

Bee County—Anderson-Prichard Oil Corp. and Mills Bennett Production Co.'s Robinson 1, Jose Maria Uranga Grant, West Tuleta area, flowing 18 bbls fluid 8 percent salt water, the rest oil, ⅛-in choke, 1000 lbs. working pressure, perforations 4467-72 ft. Humble Oil & Refining Co.'s Caswell 1, Thomas Mancha sur, 7 mi nw Pettus, abnd 2809 ft.

Cameron County—Sal Vieja Oil Co. and Pure Oil Co.'s Newberry 3, San Martin Grant, 7 mi sw Port Isabel, abnd 8168 ft.

Duval County — H. J. Porter's Garcia 1, AB&M sur 411, 2 mi sw Chiltipin, abnd 4923 ft.

Frio County—H. A. Pagenkopf et al's Houston Estate 2, Juan Fejuerroa sur, 2 mi n Frio Town and 2250 ft ne of No. 1, abnd below 3000 ft.

Karnes County—Gar Oil Co.'s Barnett 1, A. C. Hunter sur, 5 mi ne Karnes City, abnd 2519 ft.

Live Oak County—G. A. Clements' Clements Estate 1, block 15, Elizabeth Jardin sur, 4 mi s Whitsett, abnd 1140 ft.

McMullen County—W. C. McBride, Inc.'s Nueces Land and Livestock Co. 1, J. McGloin sur No. 90, in 1485-ac tr, 1 mi n Munson field, 7½ mi sw Loma Alta, abnd 1827 ft.

Medina County—T. J. Tapp's Bandele 1, F. Sauer sur No. 117, 7 mi sw Hondo, abnd 2,35 ft.

Milam County — Alex Krause, Graves 1, Jackson Hall sur, 8 mi s Buckholts, abnd 1525 ft.

Starr County—Carrie Oil Co.'s Ramierez 1, share 227, porcion No. 69, junked, skidded over for new hole, depth 289 ft. Clopton & Mitchell et al's Seabury 1, lot 2, share 30-D, Porcion No. 80, 3 mi nw Rio Grande City, flowing 25 to 30 bbls per day through open tubing, 325 lbs of casing pressure, 2757 ft.

Starr County—S. E. Gilbert et al's Escobar 1, share 37-A, porcion 71, Camargo Jurisdiction, 8½ mi n Roma, abnd 848 ft.

Webb County—Baker et al's Watkins 1, sectional San Casimero "Valentine de las Fuentes" grant, 1650 ft w of Boysen & Jones No. 5-A, abnd 700 ft. Lern Oil Corp's Spain 1, sur 17, 240-ac tr, block 2, 1 mi n Carolina-Texas field, abnd 2314 ft. W. C. McBride's Laurel 1, block 5, sur No. 719, ½ mi n Hosser No. 1, abnd 2717 ft.

Five Texas allowables adjustment hearings set

The Texas Railroad Commission has scheduled five more hearings on allowable adjustments for January.

On January 2, they will hear the following application: Refugio Oil Corporation for an increased allowable for its No. 1 J. Z. Werby in the Livingston field, Polk County.

January 3: Southwestern Production Company R. Wendt lease, North Government Wells field, Duval County, allowable increase. Application of Coastal Refining Company for an increase in the allowable in the Alta Mesa field, Brooks County, and application of The Texas Company for an increased allowable for its No. 16 R. King in the McCamey field, Upton County.

January 8: Application of South Oil Company to exempt from shutdowns its No. 1 Harrison-Peer in the South Liberty field, Liberty County.

Twenty-acre spacing asked for Consolidated

Consolidated Oil Company has requested 20-acre spacing for wells in the new Consolidated pool, Wilbarger County. The area is located in Sections 2 and 11, Block 7, and Sections 25, 35, and 36, Block 6, H&TC Railroad Survey.

Under the plan submitted, wells might be spaced 330 feet from lease lines and 660 feet apart, similar to the plan now in effect in the K-M-A field nearby.

NOTES FOR THE Equipment Buyer and User

Stop Nuts

ELASTIC STOP NUT CORPORATION

Elastic Stop Nut Corporation, 1015 Newark Avenue, Elizabeth, New Jersey, announces an expansion of its line through the introduction of nine new types of nuts all of which embody the basic Elastic Stop self-locking element, a resilient non-metallic collar which is built into the head of the nut.

This collar, in resisting the entrance of the bolt or screw, forces the thread faces into a pressure-contact which is maintained after the nut is tightened. With thread play thus eliminated, the nut can not work loose under vibration, operating stresses, or wear of surrounding parts.

The new types of nuts are designated as thin hexagonal, spline, internal wrenching, countersunk and counterbored one-lug anchor, countersunk and counterbored two-lug anchor, countersunk corner anchor, bracket anchor, floating right-angle anchor, and floating basket anchor. With variations in sizes, thread systems and materials, 160 new standard items are offered.

An extensively illustrated catalog, containing complete listings and a graphic explanation of the Elastic Stop principle, will be sent upon request to the manufacturer.

Centrifugal Pump

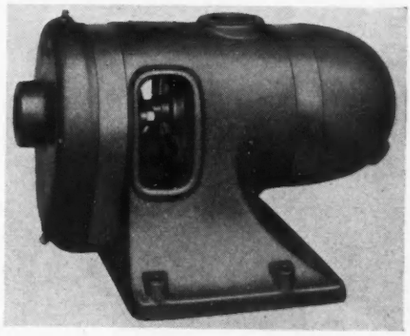
SMITH METER COMPANY

Smith Meter Company, 5743 East Leneve Street, Los Angeles, California, announces the "Smithway" centrifugal pump, featuring an ingenius combination of a fully-enclosed, self-protected, electric motor with centrifugal pump in a single compact frame.

The manufacturer claims this provides in one compact unit the smallest size-to-power and highest power-to-weight ratio of any motor operating on a standard cycle three-phase current. The most important feature, however, is said to be the fact that the pump frame is so constructed that the liquid being handled is passed around the thin tubular shell of the motor, providing definite and continuous cooling.

Design and construction of the "Smithway" centrifugal pump, the manufacturer states, offer many advantages over the conventional type pump assembly, such as, predetermined operating temperatures, assuring the maintenance of motor capacity, continuous cooling, fully enclosed, moisture-, shower-, dust-, splash-, and drip-proof features. The unit mounts in any position.

Powered with a Sawyer Hi-Power tubular type motor, ½- to 10-horsepower, the "Smithway" handles from 20 to 200 gallons per minute and operates on temperatures to 200°F or more, and heads up to 250 feet. The motor shaft is carried on two ball bearings, easily accessible, yet rigidly and compactly mounted in a single frame. Perfect alignment is maintained as the impeller of the pump is mounted directly



"Smithway" Centrifugal Pump

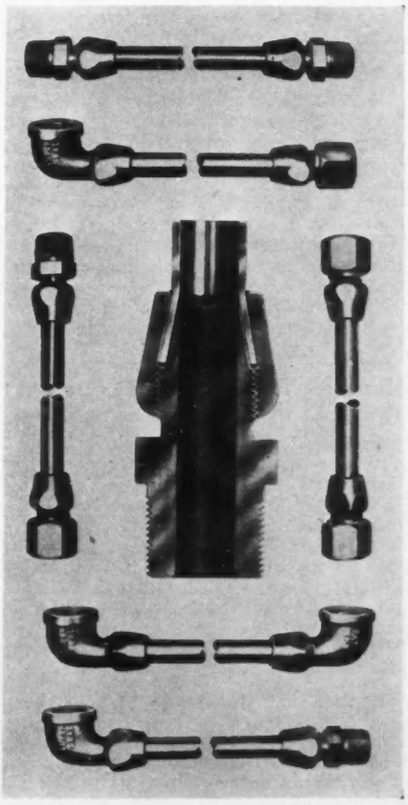
on the motor shaft. Passage ways are large. An extra large outlet pipe practically eliminates discharge losses.

Connectors

SUPERSEAL CORPORATION

Superseal Corporation, 300 Fourth Avenue, New York, has a line of connectors for use with aluminum, brass, copper and steel tubing. They are manufactured in sizes from ⅛ to 2 inches in various adaptations and in a wide range of lengths.

The design of the units includes the compression joint, sealed both inside and outside with the ends of the tubing flared to a 20-degree angle. This provides a long flare which makes a tight seal with the tubing wedged between the self-aligning compression nut and the fitting. Construction allows the sealed flare to be loosened and tightened without injury to the tubing. Another feature is the full inside diameter of both tubing and fitting.

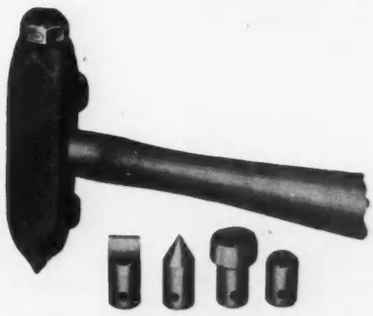


Superseal Connectors

Marking Hammer

M. E. CUNNINGHAM COMPANY

M. E. Cunningham Company, 207 East Carson Street, Pittsburgh, has devised a new type of inspector's hammer for marking metals and other hard materials. It is available in four sizes.



Cunningham Marking Hammer

Interchangeable plugs are fitted on either end of the hammer and held in place by special spring pins. Special inserts can be made for any trademark symbol.

Hose Mask Hose

DAVIS EMERGENCY EQUIPMENT COMPANY

A new type of hose, with a high resistance to penetration by organic vapors, has been developed for supplying air to men working in hose masks where the hose may be exposed to petroleum products or other liquid or vaporous rubber solvents, according to an announcement by the Davis Emergency Equipment Company, 55 Van Dam Street, New York.

When air is pumped through a 25-foot length of the new Davis hose when immersed in gasoline, in accordance with standard U. S. Bureau of Mines procedure, no gasoline vapors will be detected in this air for 36 hours, whereas gasoline will penetrate ordinary rubber air hose within 16 hours.

Another safety feature of the hose is the use of permanently attached couplings which provide connections between the lengths of hose so strong that the heaviest man can be lifted bodily out of a tank by his hose should fouling of his life line make this necessary.

A-1 Bit and Universal Core Barrel Name Foreign Representative

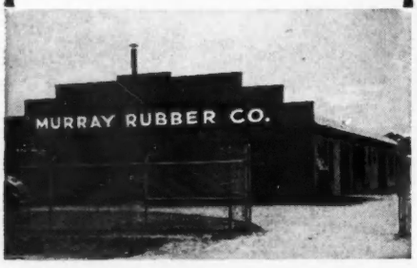
I. Frank Brown, 30 Rockefeller Plaza, New York, has been appointed foreign representative for A-1 Bit & Tool Com-

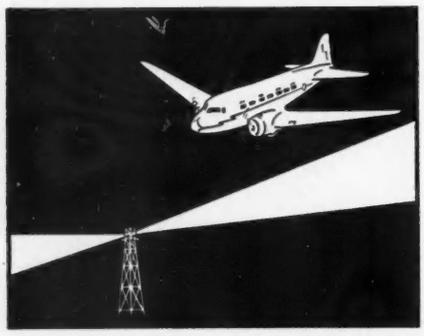
ROBINSON
PACKERS AND SWABS
MANUFACTURED BY
ROBINSON PACKER CO.
ARE EQUIPPED WITH
MURRAY RUBBER

Packer and swab rubbers lead a tough life. They've got to be good to stand up under the severe service for which they are designed. This is another instance where Murray Rubber is providing top-notch performance.

Our modern facilities and strict supervision of all work enable us to give the highest quality and efficient service on mechanical rubber goods and synthetic oil-resisting products.

MURRAY
RUBBER COMPANY
606-8 N. Milby Preston 7017
HOUSTON, TEXAS





A SURE SAFEGUARD AGAINST DISASTER

Beacon lights and the OTIS REMOVABLE TUBING SAFETY VALVE have one thing in common. Each is a sure safeguard against disaster. The Tubing Safety Valve prevents wells running wild due to damage or failure of surface controls. Wells with dangerous surface working pressures, or ones located out in water, in townsites, or in war-threatened areas need the protection Otis Removable Tubing Safety Valves afford.

WRITE **OTIS** TODAY
PRESSURE CONTROL
INCORPORATED
DALLAS, TEXAS

NOTES FOR THE Equipment Buyer and User

I. FRANK BROWN

pany and Universal Core Barrel Company, both of Houston. Brown is familiar with foreign operations and for a number of years has been representing several oil field supply companies as their foreign representative.

Air Reduction Sales Company Has New Oklahoma City Manager

G. J. Dekker, formerly assistant manager of the Detroit district of Air Reduction Sales Company, has been appointed manager of the Oklahoma City district. Dekker has been associated with Air Reduction in many different capacities for over 20 years. Prior to his appointment, he has served as assistant manager in the Chicago, Cleveland and Detroit offices. At Oklahoma City he replaces D. F. McCandlish who has been transferred to Detroit as district manager.

Hercules Names F. G. Trescher Manager of San Francisco Office

F. George Trescher has been named manager of the San Francisco office of Hercules Powder Company, effective January 1.

Mr. Trescher has been actively identified with the explosives industry for many years and has been a member of the Hercules West Coast organization since 1925. He was named assistant manager of San Francisco office on March 1, 1939, and acting manager in August.

Allied Steel Products Moves Sales Office in Tulsa

Allied Steel Products Corporation, Tulsa, announces removal of its general sales office from the plant at 1407 N. Peoria, to the Thompson Building.

The Buda Company Appoints Peterson Plant Manager

The Buda Company of Harvey, Illinois, has announced the appointment of D. C. Peterson as plant manager in charge of all manufacturing operations, succeeding E. D. Conant who recently resigned as vice president in charge of manufacturing.

Peterson formerly was connected with Buda for 16 years—starting in 1918, serving as electrical engineer, plant engineer and finally general superintendent of production.

During the past five years he has been with Continental Can Company, and spent two years in Europe constructing a tin plate mill for The Metal Box Company of England, an affiliate of Continental Can Company. More recently he served in a technical advisory capacity studying all types of tin plate operations in the United States and Canada.

D. C. PETERSON

Standco
NO-SMOKE
STANDCO BRAKE LINING
Is the driller's best friend because it makes the easiest brake known and "feeds off" evenly while drilling. It never scores brake rims. See Page 2100 Composite Catalog.
Standco Brake Lining Co.
HOUSTON

NOTES FOR THE Equipment Buyer and User

Dr. Mudge Joins New York Office Of International Nickel

Mr. A. J. Wadhams, vice president and manager of the development and research division of The International Nickel Company, has announced the addition of Dr. William A. Mudge to the technical service division of the New York office.

For the past 17 years Dr. Mudge has been superintendent of research, superintendent of the refinery and works metallurgist at the company's Huntington, West Virginia, rolling mill. Before being transferred to the Huntington plant, Dr. Mudge spent two years at the company's Bayonne, New Jersey, refinery, where he joined The International Nickel Company in 1920.

Midco Tool & Supply Company Appoints Foreign Representative

Appointment of Acme Well Supply Company, 19 Rector Street, New York City, as its export representative, was announced recently by Midco Tool & Supply Company, Oklahoma City.

Acme Well Supply Company will handle foreign distribution of all Midco products.

Independent Exploration Company moves Laboratory

Independent Exploration Company and Kannenstine Laboratories held open house at their recently completed modernistic air conditioned laboratory and shop building at 1922 West Gray in Houston on December 23. T. I. Harkins, Dr. F. M. Kannenstine, A. L. Smith, Dr. J. L. Adler, J. W. Flude, R. S. Jackson, W. E Steele and others were on hand to greet the large number of oil men and other friends who attended. Special interest was shown in the machine shop with its precision instruments and concealed wiring, the automotive maintenance department and the four private research laboratories.

Executives offices of the companies will continue to be located downtown on the twentieth floor of the Esperson building.

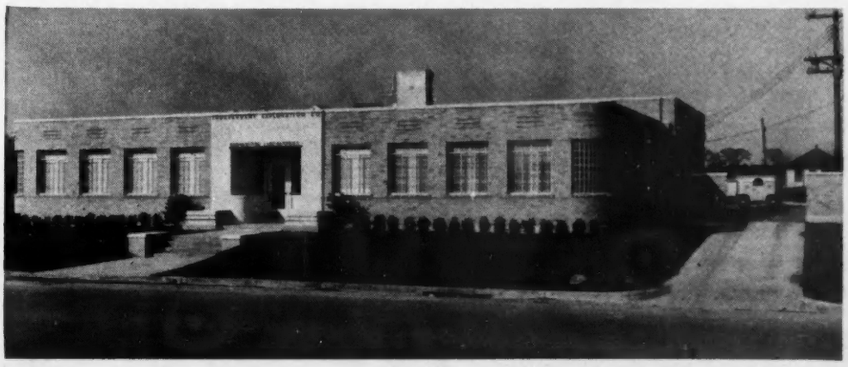
The new building is 80 by 80 feet of modernistic style, constructed of steel and masonry, with automobile storage in the rear. The offices, electrical laboratory, optical laboratory, review interpretation department and the lobby are floored with concrete finished in asphalt tile. The machine shop is floored in hard maple which is raised about two feet in order to allow for concealed wiring to each machine. The building, with the exception of the automobile and trailer shop, is air conditioned. The cost of the building was approximately $35,000. The front half is constructed so that a second story may be added when necessary.

Dr. C. M. A. Stine to Get Perkin Medal

The thirty-fourth impression of the Perkin Medal will be presented to Dr. Charles M. A. Stine, director of research and vice president of E. I. du Pont de Nemours & Company, at a joint meeting of the Society of Chemical Industry, American Chemical Society, American Institute of Chemical Engineers, the Electrochemical Society and Societe de Chimie Industrielle, on January 12, 1940. The medal is awarded annually for valuable work in applied chemistry. Dr. Wallace P. Cohoe, chairman of the American Section, will preside over the meeting. The program will commence with a commemoration of former medalists by Dr. Cohoe. This will be followed by a talk on the life and accomplishments of the medalist by Dr. Harrison E. Howe, editor of Industrial and Engineering Chemistry. After the presentation of the medal by Professor Marston T. Bogert, senior past president of the society, Dr. Stine will give the medal address entitled "The Rise of the Organic Chemical Industry in the United States." The meeting will be held at 8:00 p.m. at The Chemists' Club, 52 East 41st Street, New York City. A dinner in honor of Dr. Stine will also be held there preceding the meeting, starting at 6:45 p.m.

Perez & Helton Agents for Swift Lubricator at Houston

Swift Lubricator Company, Elmira, New York, has announced appointment of Perez & Helton, 1701 Commerce Street, Houston, as its agent for Texas and Louisiana.



Independent Exploration Company and Kannestine Laboratories' Laboratory and Shop Building opened last week at Houston.

REED'S 'B-R' DRILLING BIT WITH WIRE LINE RETRACTABLE CORE BARREL

HARD FORMATION HEAD (Interchangeable with Soft Formation Head)

REED 'B-R' Drill Collar and 3-Blade Drilling Bit with Core Barrel in position

REED ROLLER BIT CO.

MacCLATCHIE

"Money-Saver" PUMP LINERS

. . . are made by an exclusive process from special alloy seamless tubing and ground to a mirror finish. Absolutely uniform in extreme hardness, **these liners have no soft spots to haste n breakdown or cause pitting!**

And here's another important point — the wear-free gland used with "Money-Saver" Pump Liners can be quickly slipped off the worn liner and placed on the new one. Thus, you save on both shipping costs and maintenance costs —buying **only the liner itself** (without glands) when renewing MacClatchie "Money-Savers!"

Write for Complete Details

MacCLATCHIE MANUFACTURING CO.
COMPTON, CALIFORNIA
Mid-Continent Distributor, HAKE TOOL COMPANY, Houston, Texas
Rocky Mountain Representative, E. C. DILGARDE, Casper, Wyoming
Foreign, GEORGE R. WOODS, 17 Battery Place, New York, N. Y.

Squeaks from the Bull Wheel

Rye in Rhyme

The horse and mule live thirty years
And nothing know of wines and beers.
The goat and sheep at thirty die
And never taste of Scotch and rye.
The cow drinks water by the ton
And at eighteen is mostly done.
The dog at fifteen cashes in
Without the aid of rum and gin.
The cat in milk and water soaks
And then in twelve short years it croaks.
The modest, sober, bone dry hen
Lays eggs for nogs then dies at ten.
All animals are strictly dry
They sinless live and swiftly die.
But sinful, ginful, rumsoaked men
Survive for three score years and ten.
And some of us, the mighty few
Stay pickled 'til we're ninety-two.

Wanted It Stopped

A number of years ago a Chief Justice took the several justices of the court for a run down Chesapeake Bay. A stiff wind sprang up and one judge was getting decidedly the worst of it.

The Chief Justice touched him on the shoulder and said in a tone of deepest sympathy, "Is there anything I can do for you?"

"No thank you, unless Your Honor can overrule this motion."

Specialized

"He got rich in six months by writing poetry!"

"Indeed!"

"Yes; wrote love sonnets to a rich widow!"

Nearing Perfection

"You cough more easily this morning."

"Well, I should. I've been practicing all night."

The Test

A man may smile in the face of death.
But there never will be found
A man who can draw a placid breath
When his garters are coming down.

New Angle

"If your children become unmanageable, quickly switch their attention."

"Their what?"

Or For

"I thought I told you to come after supper."

"That's what I came after."

Well?

I want accommodations for an airplane trip round the world.

Yes, sir, one way?

Not Too Heavy

"How's de collection at yo' church, Brother Moses?"

"Well, I ain't had to stop lately in de middle ob de collection to go an' empty de box."

How Annoying

"Elmer, I wish you wouldn't whistle at your work."

"I wasn't working."

Profit and Loss

One of the questions asked in a civil service examination was:

"If a man buys an article for $12.25 and sells it for $9.75, does he gain or lose by the transaction?"

One of our modern sweet things, probably with good looks unmarred by brains, after studying for awhile, is said to have given the following answer:

"He gains on the cents, but loses on the dollars."

Slight Error

"Who spilled mustard on this waffle, dear?"

"Oh, John! How could you? This is lemon pie."

Just Good Manners

"The horse and the cow is in the field." Archie, will you tell us what is wrong with that sentence?

I'm not sure, Teacher, but I think you shoulda mentioned the lady first.

Relief

The grandmother was tucking her four-year-old grandson into bed. "All right, my dear," she whispered softly, "are you ready for your bedtime story?"

The child began to fidget. "Grandmother," he murmured, "not tonight, please."

"Then shall I sing you a lullaby?"

"No, no lullaby."

"Then what can I do for you, my child?"

"Well, suppose you take a walk and let me get some sleep."

United We Stand—

"Sometimes it will be necessary for you to help the butler upstairs.' '

"I understand, madam; when he's had one too many."

No News

The crystal gazer peered closer into her mystic glass. "I see," she whispered, "I see a buried treasure."

Her visitor moved impatiently. "I know," he said. "I know all about him. He's my wife's first husband."

Point of View

I see the market report says that money is easier.

That must refer to its goin'. I'll be blamed if it's any easier comin'.

Twins

"My brother and I were twins. We looked so much alike that no one could tell us apart. One day in school my brother threw spitballs, and I was punished. My brother was arrested for speeding, and I spent three days in jail and paid a fine for it. I had a girl, and my brother ran off with her. But last week I got even with him—I died, and they buried him."

TWO WORDS THAT MEAN
"Less Trouble with Pipe Lines"...

Devlin Fittings give pipe lines added protection at the joints where it's needed most to assure long service with greater freedom from failure. Get Devlin's high standard of materials, manufacture and inspection for sure satisfaction.

DEVLIN BLUE RING 3 PART MALLEABLE IRON FLANGE UNIONS

Ground Joint—Brass to Iron Seat—300 lbs. Working Steam Pressure; 600 lbs. Cold Oil, Water or Gas Working Pressures.

DEVLIN HEAVY OIL MALLEABLES ELBOWS and TEES

For 300 pounds Working Steam Pressure and for cold, Non-Shock Working Oil, Water or Gas Pressures as follows:

1" and smaller	2000 lbs.
1¼" to 2"	1500 lbs.
2½" to 4"	1000 lbs.
6"	800 lbs.

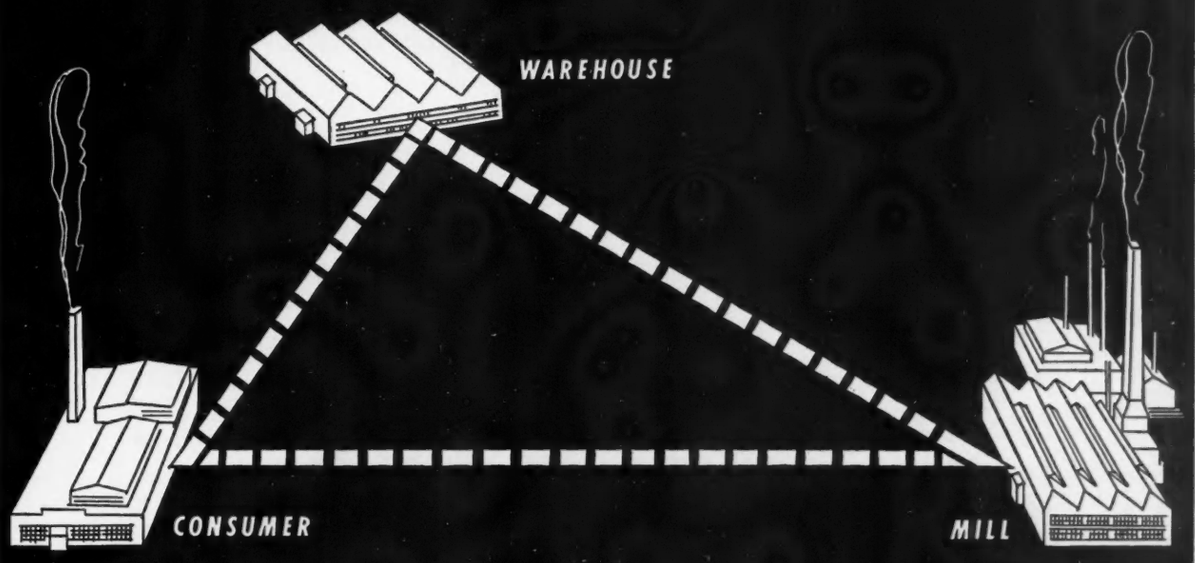
FULL RANGE OF SIZES AVAILABLE IN BLACK OR GALVANIZED FINISH.

THOMAS DEVLIN MANUFACTURING CO., Burlington, N. J.

Complete stock (including Standard, Malleable and Cast Iron Fittings and Nipples) always carried by J. E. Bobo, 2120 Rockwell Street, Houston, Texas, and at the factory.
WRITE FOR CATALOG 15-A.

A Straight Line

IS NOT ALWAYS THE SHORTEST DISTANCE BETWEEN TWO POINTS!



ALLOY STEELS

CARBON STEELS

TOOL STEELS

STAINLESS STEELS

MINING DRILL STEELS

COLD FINISHED STEELS

MILD STEEL

STRUCTURALS

SHEETS-PLATES

ARE delayed deliveries on your mill orders causing you a lot of grief? Are your production schedules being blown into a cocked hat? Let us help you take care of present production requirements with steel from our large and varied warehouse stocks. With three warehouses—Houston, Los Angeles and Oakland—to draw from, we can offer you immediate delivery.

EARLE M. JORGENSEN CO.

"Selling Bethlehem Steels"

HOUSTON • LOS ANGELES • SAN FRANCISCO • OAKLAND

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The Inferno Co.	—
*Ingersoll-Rand Co.	—
*International Harvester Co.	—
*The International Nickel Co.	—

J

*D. O. James Manufacturing Co.	—
*Jarecki Manufacturing Co.	—
*Jensen Brothers Manufacturing Co.	—
*Johns-Manville	—
*M. O. Johnston Oil Field Service Corp.	—
The Jones Oil Co.	—
The S. M. Jones Co.	—
*Jones & Laughlin Steel Corp.	—
Jones-Shelburne, Inc.	—
Earle M. Jorgensen Co.	73

K

The Kennedy Valve Manufacturing Co.	—
*Kerotest Manufacturing Co.	—
*Keuffel and Esser Co.	—
*Kinzbach Tool Co.	—
*Koppers Co.	—
*Kropp Forge Co.	—

L

Landis Machine Co.	—
*Lane-Wells Co.	—
*Larkin Packer Co.	—
*The Layne & Bowler Co.	—
Le Roi Co.	—
Lee Rubber and Tire Corp.	—
Hotel Lenox	—
*A. Leschen & Sons Rope Co.	—
*The Lincoln Electric Co.	—
*Line Scale Co.	—
*Link Belt Co.	—
Lone Star Cement Corp.	—
*Lucey Boiler & Manufacturing Co.	—
*The Ludlow Valve Manufacturing Co.	—
*Lufkin Foundry & Machine Co.	—

M

*MacClatchie Manufacturing Co.	71
Macwhyte Co.	—
*D. S. Mair Machinery Corp.	—
*Maloney Tank Manufacturing Co.	—
Manhattan Rubber Division	—
The Marley Co.	—
Marmon-Herrington Co.	—
*Martin-Decker Corp.	—
McCollum Exploration Co.	—
McEvoy Co.	—
McGill Manufacturing Co.	—
McKissick Products Corp.	—
*Merco Centrifugal Co.	—
*Merco Nordstrom Valve Co.	—
*Metric Metal Works	—
*Midco Bailer Co.	—
*Miller Sand Pump Co.	—
*Mission Manufacturing Co.	—
*Lee C. Moore & Co.	—
*Morse Chain Co.	—
*Motor Improvements, Inc.	—
Mudrite Products Co.	—
Murray Rubber Co.	70
*Muskogee Iron Works	—

N

National Bank of Tulsa	—
*National Lead Co.	—
The National Supply Co.	40-41
National Tube Co.	—
*Novo Engine Co.	—

O

*O.C.S. Manufacturing Co.	—
*Walter O'Bannon Co.	—
*Oil Center Tool Co.	—
*Oil City Brass Works	—
Oil Industry Mailing List Co.	68
Oil Well Supply Co.	—
*Otis Pressure Control, Inc.	70

P

*The Parkersburg Rig & Reel Co.	—
*Patterson Ballagh Corp.	—
*Pelican Well Tool & Supply Co.	61
Petroleum Electric Power Assn.	—
Petroleum Rectifying Co. of California	—
Petty Geophysical Engineering Co.	—
*Pittsburgh Equitable Meter Co.	—
*Pittsburgh Steel Co.	10
Plymouth Cordage Co.	—
*Portable Rig Co.	—

R

Raybestos-Manhattan	—
Reading-Pratt & Cady Division of American Chain & Cable Co.	—
*Rector Well Equipment Co.	—
*Reda Pump Co.	—
*Reed Roller Bit Co.	34-35 and 71
*Regan Forge & Engineering Co.	—
*Joseph Reid Gas Engine Co.	—
*Republic Steel Corp.	—
*The Ridge Tool Co.	—
Roper & Todd	68

S

Safety Gas Main Stopper Co.	—
Jack A. Schley	68
*Schlumberger Well Surveying Corp.	—
The Second National Bank of Houston	—
Seismic Exploration Co.	—
Seismograph Service Corp.	—
Shell Oil Co., Inc.	—
*SKF Industries, Inc.	—
A. O. Smith Corp.	—
*E. M. Smith Co.	4
*Howard Smith Co.	—
*South Chester Tube Co.	—
Southern Engine & Pump Co.	—
Southern Pacific Lines	—
Spang Chalfant, Inc.	—
*Sperry-Sun Well Surveying Co.	—
Standard Supply and Hardware Co.	—
*Standco Brake Lining Co.	70
*Star Drilling Machine Co.	—
Stevens Hotel	—

T

*Templeton, Kenly & Co.	—
Texaco Development Corp.	—
The Texas Corp.	—
Texas Electric Steel Casting Co.	—
Texas Foundries, Inc.	—
*Texas Iron Works	—
Thermoid Rubber, Division of Thermoid Company	—
Thompson Tool Co.	—
*The Timken Roller Bearing Co.	—
Town House Hotel	—
*Tretolite Co.	—

U

*Union Wire Rope Corp.	—
Union Carbide & Carbon Corp.	—
*Unit Rig & Equipment Co.	—
*United States Rubber Co.	—
United States Steel Corp.	—
*Universal Atlas Cement Co.	—

V

Vickers, Inc.	—

W

Warner & Swasey Co.	—
The Watson-Stillman Co.	—
*Waukesha Motor Co.	—
Webster Engineering Co.	—
*Well Machinery & Supply Co.	—
*Westinghouse Electric & Manufacturing Co.	—
*The Wheland Co.	—
*Wickwire Spencer Steel Co.	—
*J. H. Williams & Co.	—
*Wilson Manufacturing Co.	—
*Wilson Supply Co.	—
Witte Engine Works	—
*Worthington Pump & Machinery Corp.	—
Wyatt Metal & Boiler Works	—

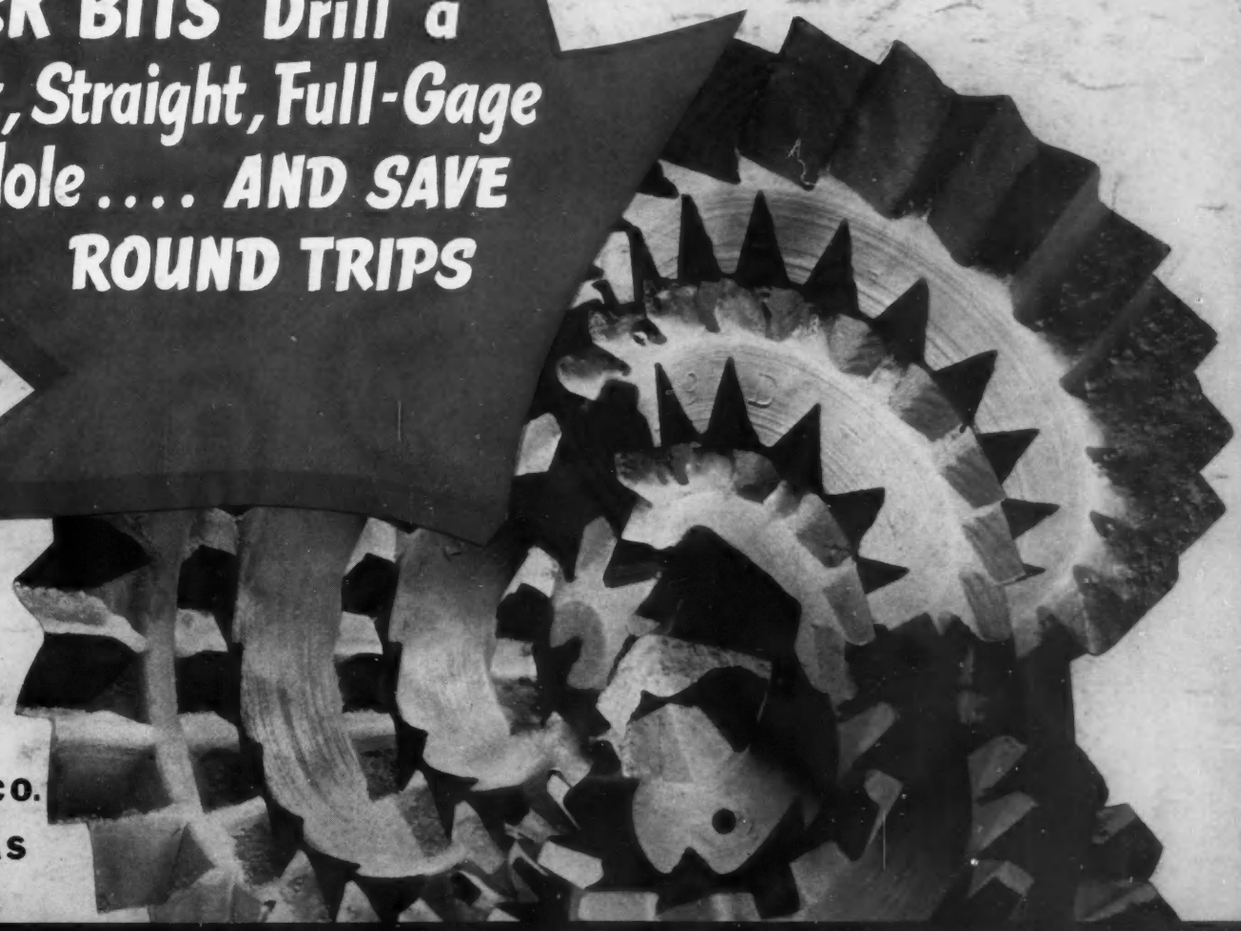
Y

Youngstown Sheet & Tube Co.	8

"ROCK BIT-OLOGY" Says:

Balanced and Free-Cutting Cones Pay Footage Dividends

HUGHES TAILOR-MADE **ROCK BITS** Drill a Fast, Straight, Full-Gage Hole.... AND SAVE ROUND TRIPS



UGHES TOOL CO.
OUSTON, TEXAS

Please note typical 'Starcor' performance, as shown by these job-record cards—part of a success record on job after job that merits the Oil Man's consideration.

L 3901

FIELD: Horse Shoe Bayou State Land
TYPE OF JOB: Casing cement job
DEPTH OF WELL: Casing set at 11,631 ft.
MAX. TEMP.: 250° F.
SLURRY WEIGHT: 16 lb. per gal.
CEMENT USED: 'Starcor', 1500 sacks
MIXING TIME: 32 min.
PUMPING-DOWN TIME: 53 min.
MAX. PUMP. PRESSURE: 2300 lb.
REMARKS: Note ease with which 16-lb. 'Starcor' slurry was pumped into position. Well - 11,631 ft. deep. Temperature plenty hot -- 250° F.

S 1417

FIELD: Lake Pelto, La.
TYPE OF JOB: Casing
DEPTH OF WELL: 5,500 ft.
MAX. TEMP.: 150° F.
SLURRY WEIGHT: 16 lb. per gal.
CEMENT USED: 'Starcor', 400 sacks
MIXING TIME: 18 min.
PUMPING-DOWN TIME: 27 min.
MAX. PUMP. PRESSURE: 1800 lb..
REMARKS: Formation in this field so soft that holes are almost always crooked. Another good 'Starcor' job, under very difficult conditions.

"Sure it Pays TO USE AN OIL MAN'S CEMENT"

NOTHING succeeds like success. Which is why 'Starcor's record on job after job—in deep, hot wells . . . in soft formations with crooked holes . . . on difficult squeeze jobs—is the Oil Man's soundest assurance.

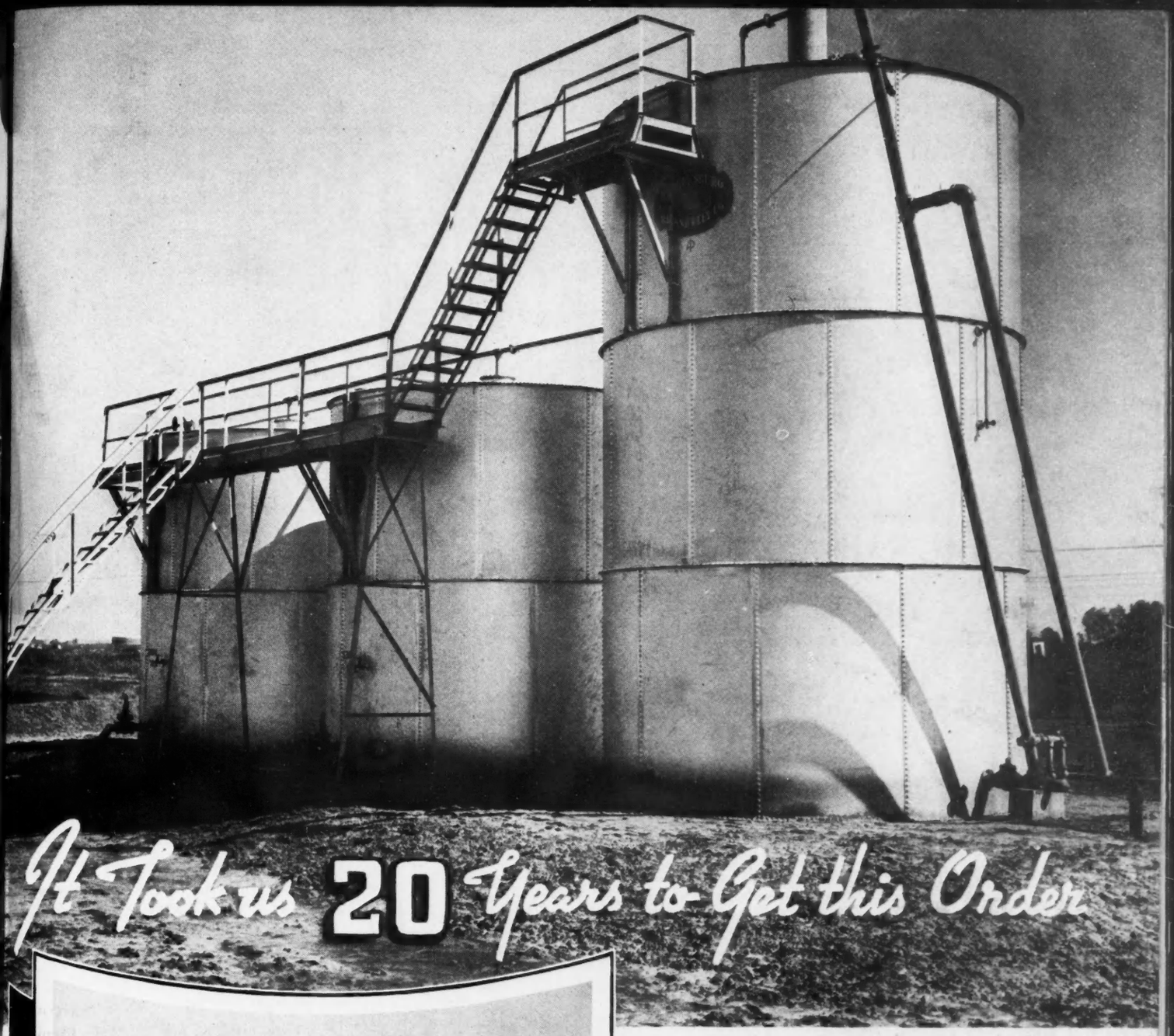
Continuing research, in the laboratory and in the field, enables Lone Star to make cements with the properties and qualities needed to meet the ever-changing conditions of oil industry service. Earning, for both 'Starcor' and 'Incor', the right to be called the Oil Man's Cements.

'Starcor' for deep wells, greater length and ease of pumpability at high temperatures. 'Incor' for wells of moderate depth—earlier drill-out, wells on production quicker. Use 'Starcor'* or 'Incor'* next time—it'll pay you well.

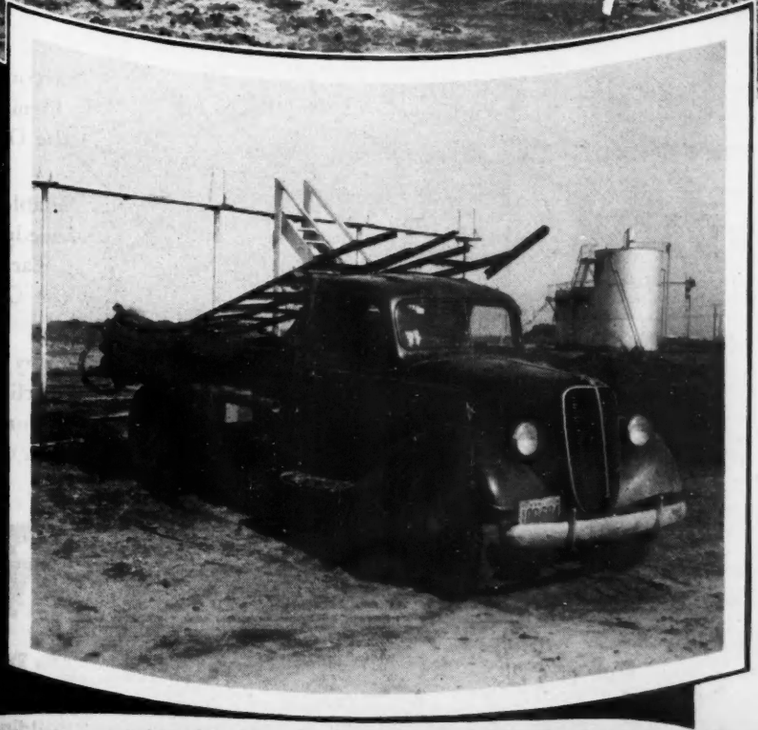
*Reg. U.S. Pat. Off.

LONE STAR
CEMENT CORPORATION

DALLAS: Santa Fe Building . . . . HOUSTON: Shell Building



It Took us 20 Years to Get this Order



BECAUSE THE PARKERSBURGS SOLD IN 1919 DIDN'T NEED REPLACING

In the fall of 1919 we got an order for erection of two 500-barrel and one 750-barrel bolted steel tanks in a Texas Gulf Coast field. In the fall of 1939 we got a repeat order, to replace them, despite the fact a clean-up job and a few replacement parts would have given the 20-year-old tanks a lot more service. The picture above shows a close-up view of the new battery. The inset at left shows the same battery in the background, with the last load of old side sheets ready to be hauled away . . . just another of the many cases proving the quality that is built in Parkersburg lease storage tanks, whether bolted steel, wrought iron or wood.

THE PARKERSBURG RIG & REEL COMPANY

PARKERSBURG, W. VA.

DALLAS - HOUSTON - TULSA
LOS ANGELES - NEW YORK

THE PARKERSBURG RIG AND REEL CO.

C-1-40

PARKERSBURG DEPENDABLE LEASE STORAGE TANKS

Sailing "in High"
– IN POPULARITY
Sunbeam
Super STREAMLINER

Between
HOUSTON-DALLAS

This orange, black and crimson streamliner, several inches wider than regular trains, has captured the imagination and favor of the Southwest.

It glides over the rails with remarkable, effortless smoothness. There is no vibration, no jolting—just smooth sailing. Enjoy it on your next trip between Houston and Dallas.

Lv. HOUSTON ..... 4:45 P.M.

Connections for Colorado, Oklahoma, Kansas City, St. Louis, Chicago, New York, East.

Lv. DALLAS ..... 5:00 P.M.

Connections for California, Corpus Christi, Rio Grande Valley, Beaumont, New Orleans, East.

Two other fast trains daily between Houston and Dallas—Overnight Owl and Morning Hustler.

SOUTHERN PACIFIC LINES

BARGAIN ROUND-TRIPS
Between
HOUSTON-DALLAS
$6 In Chair Cars
Daily; limit 15 days
$11 In Parlor Car (seat extra)
Daily; limit 60 days

Southern Pacific
J. T. MONROE, Passenger Traffic Mgr.,
"SP" Bldg., Houston, Texas

SHIP VIA S.P. . . . FREE PICK-UP AND DELIVERY SERVICE

LOOKING AHEAD

WITH THE EDITOR

The Pumping Production Problem at Rodessa.

NON-FLOWING wells in the Rodessa field are being produced by gas lift, plunger lift, and conventional rod-and-tubing pumps, the selection in some parts of the area having been largely a matter of personal opinion. The field is spotted and lacks uniformity from one well to another. Lower fluid levels and declining bottom-hole pressures have been influencing factors in the selecting of lifting methods and equipment.

Of the 1100-odd wells in the field, more than half are still flowing naturally. Operators have experimented for months in typical wells, with the hope of determining the most effective lifting method for given conditions. Many of the non-flowing wells are passing through an intermediate stage that gives gas lift an advantage, but more settled conditions may be more favorable to pumping operations.

Heavy rod strings are used in pumping wells, but ideas differ sharply as to pump sizes. Some companies are experimenting with large and small pumps in an effort to determine or check advantages offered by either. Small pumps lift the required amount of fluid in 24 hours, while the larger pumps may lift their quotas in 12 to 14 hours.

THE OIL WEEKLY will soon present an article on lifting methods at Rodessa. The field produces from several levels, and problems are varied and interesting.

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